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Toxic effects of herbal medicines: *Teucrium polium* and acute kidney injury

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ABSTRACT

Herbal medicines are believed to be effective in the treatment of many diseases. The genius *Teucrium* is a member of *Lamiaceae* family, which contains more than 300 species. Antimutagenic, anticancer, hypoglycemic, antibacterial, anti-inflammatory, antipyretic, antiulcer, hypolipidemic and antidiarrheal effects of *Teucrium polium* have been reported in the studies. In this article, we describe an acute kidney injury (AKI), which is thought to have developed as a result of *T. polium* use for the treatment of diabetes mellitus. It should not be forgotten that herbal medicine is an important reason for AKI. In addition, community should be made aware of the danger of herbal medicines which especially have potential renal and hepatic side effects.

Keywords: acute kidney injury, *Teucrium polium*, diabetes mellitus, bariatric surgery

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Diabetes mellitus (DM) is a chronic disease that occurs due to impairment of insulin secretion and decrease in insulin function; it leads to increase in blood glucose. Thus, it causes retinopathy, nephropathy, neuropathy and cardiovascular complications. Since DM taking place among oxidative stress related diseases; various antioxidants, herbal medicines thought to have antioxidant effect are believed to be effective in the treatment of the disease and its complications. Therefore, uncontrolled use of herbal medicines is increasing all over the world. The most important plants believed to be effective in DM treatment are different species of *Lamiaceae, Asteraceae* and *Apiaceae* families [1]. Various toxic effects, especially renal and hepatic damages, can occur with the increase in the use of these plants that we do not yet fully understand the mechanisms of action and side effects. Acute kidney injury (AKI) can be defined as a decline in the glomerular filtration rate that results rapid renal function impairment.

AKI cases due to exposure to nephrotoxins such as contrast agent and herbal medicine are considerably higher. Exposure to contrast agent and herbal medicine can be the cause of nephrotoxicity and AKI.

In this article, a diabetic patient refused oral antidiabetic treatment and required hemodialysis because of AKI after using T*eucrium polium*, has been described.

CASE PRESANTATION

A 46-year-old female was admitted to the emergency service with fatigue continuing about 10 days. The patient has had metrorrhagia for the last 2 years but has not been examined for this reason before.

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Hemoglobin was found 6.1 gr/dl on hemogram evaluation and she was admitted to gynecology clinic. Endometrial thickening detected in ultrasonographic evaluation. Endometrial curettage was performed to stop vaginal bleeding and to take a diagnostic sample. Then, norethisterone 15 mg/day treatment started. Blood urea nitrogen (BUN): 112 mg/dl, creatinine: 15.9 mg/dl, potassium: 6.4 meq/L were detected in the biochemical tests, performed approximately 10 hours after hospitalization. The patient was urgently consulted with nephrology clinic. It was learned from the patient history that she was diagnosed with DM 3 months ago. She used oral antidiabetic therapy for only one mont hand did not use the last two months. She boiled a pinch of meryem hort plant with water and drank iteveryday. Apart from that, there was no chemical, herbal medicine and contrast agent exposure. Creatinine level was 0.8 mg/dl in the endocrinology outpatient clinic 2 months ago.

On the physical examination of the patient consciousness, co-operation and orientation were normal. Arterial blood pressure was160/90 mmHg, body temperature was 36.7 °C, pulse rate was 80/min. Crepitant crackles were heard in the lower zones of lung in the respiratory system oscultation. There was no additional pathology other than vaginal bleeding, suggesting metrorrhagia for 2 years. Femoral hemodialysis catheter was inserted urgently, and the patient was hemodialized without heparin for 2 hours. In other biochemical assays, leukocyte: 12100/mm^3, platelet: 131000/mm^3, sedimentation: 88 mm/h, C-reactive protein: 17.2 mg/l were detected and there were 37 leukocytes, 16 erythrocytes in urine analysis. 2 grams of proteinuria was seen in the 24-hour urine analysis, but his result was not reliable due to urinary system infection. Thyroid function tests, hepatitis markers, lipid profile were normal. No pathological findings were found in renal doppler ultrasonography. The long axis of the right kidney was 13 cm and the left kidney was 11 cm.

The patient was alerted not to use meryem hort plant again. Treatment with norethisterone 15 mg/day for vaginal bleeding continued. There was no evidence of malignancy in endometrial curettage pathology and vaginal bleeding did not continue. Hemodialysis was performed 6 times in the first 8 days after admission. Due to the detection of Streptococcus agalactia in urine culture, linezolid therapy was initiated with the recommendation of the infectious diseases clinic and renal biopsy could not performed. Because of high sedimentation, anemia and rapid progressive acute renal injury the patient was evaluated in terms of multiple myeloma and vasculitis (protein electrophoresis, serum and urine immunization electrophoresis; p-ANCA, c-ANCA, anti-glomerular basement membrane antibody). The results were normal. She was followed only with oral and intravenous hydration from the 8th day of admission and creatinine value was 0.8 mg on the 21st day. AKI was thought to be caused by teucrium polium. Kidney function tests returned to normal after 21 days. The patient is still in routine control at our nephrology clinic.

DISCUSSION

The genus *Teucrium* is a member of *Lamiaceae* family, which contains more than 300 species [2]. In Turkey, it is known as meryem hort plant. It grows up to 1000 meters above sea level and mostly in the arid rocky areas of South West Asia, North Africa, Mediterranean and Europe. This plant was used for thousands of years, considering that it is effective in the treatment of cough and asthma. Numerous effects of *T. polium* such as antimutagenic, anticancer, hypoglycemic, antibacterial, anti-inflammatory, antipyretic, antiulcer, hypolipidemic and antidiarrheal effects have been reported in many studies [3]. For this reason, up to now, it has been used in the treatment of many diseases such as pain, DM.

However, for all known positive effects, the potential organ side effects, liver and kidney effects must be known for a 'safe use' of herbal or chemical drugs. Otherwise, herbal medicines, which are recommended for therapeutic purposes, may cause many unwanted side effects. Essential oils constitute 0.45% of *T. polium*. It is also thought that the sephenolic compounds in these essential oils have antidiabetic effects [4].

In a study investigated whether *T. polium* hydroalcoholic extract caused renal toxicity, 100 male Wistar rats were examined and the rats were divided into two groups [5]. The first group was given intraperitoneal *T. polium* for 28 days to examine possible renal damage. The second group was given

intraperitoneal *T. polium* for 28 days and after 28 days without medication, renal examination was performed in the second group. Renal damage was not seen in the first group but in the second group, renal damage findings such as vacuolization, destruction and degeneration were detected. According to our investigations, there is no study except only one study [5] in the literature which examines the relationship between *T. polium* and AKI. In our case, AKI occurred at approximately 2 months after the use of *T. polium*. However, pathologic findings of renal injury could not be detected because of the development of urinary tract infections in our patient and the inability to perform renal biopsy.

CONCLUSION

In this article, we describe an AKI due to unconsciously used *T. polium* to control blood glucose. It should not be forgotten that the use of herbal medicines is an important reason for AKI and it should be asked every patient admitted due to AKI. Inaddition, community should be warned not to use herbal medicines whose especially renal and hepatic side effects are not known.

Informed consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict of interest

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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