10.5152/turkjnephrol.2021.4399

Case Report

Turkish Journal of Nephrology

An Unusual Case of Acute Kidney Injury Due to Secondary Oxalate Nephropathy Caused by Herbal Medicine

Tuba Elif Özler[1], Egemen Cebeci[1], Yasemin Özlük[2], Sami Uzun[1], Oktay Özkan[1], Serhat Karadağ[1], Fatma Pınar Ziyadanoğlu[3], Savaş Öztürk[1]

[1]Department of Nephrology, Haseki Training and Research Hospital, Istanbul, Turkey
[2]Department of Pathology, Istanbul University School of Medicine, Istanbul, Turkey
[3]Department of Internal Medicine, Haseki Training and Research Hospital, Istanbul, Turkey

ABSTRACT

An 81-year-old female patient was examined for acute renal failure. In her renal biopsy, oxalate nephropathy was detected. It was observed that before the deterioration of her renal functions, she had drunk water boiled with leaves of the plane tree which led to change in the color of her urine. Oxalate nephropathy due to consumption of water boiled with the leaves of the plane tree was considered as the diagnosis in the patient, after excluding all known factors regarding secondary oxalate nephropathy. Primary oxalosis was excluded due to the age of the patient. It is the first case to be reported in the literature on oxalate nephropathy due to consumption of plane tree leaves .

Keywords: Acute kidney injury, herbal, oxalate nephropathy, secondary oxalate nephropathy

Corresponding author: Fatma Pınar Ziyadanoğlu ✉ pinarziyadanoglu@hotmail.com **Received:** April 18, 2020 **Accepted:** January 23, 2021

Cite this article as: Elif Özler T, Cebeci E, Özlük Y, et al. An unusual case of acute kidney injury due to secondary oxalate nephropathy caused by herbal medicine. *Turk J Nephrol.* 2021; 30(2): 183-185.

INTRODUCTION

Oxalosis is a metabolic disorder which causes deposition of oxalate in various organs, including kidneys. While the occurrence of oxalate nephropathy after increased oxalate intake is rare, there are case reports in the literature in which the disease was seen after intake of star fruit (*Averrhoa carambola*) juice,[1,2] peanut,[3] and *Averrhoa bilimbi*.[4]

This case report presents a case of acute oxalate nephropathy for which renal biopsy was done due to the occurrence of acute renal failure after drinking water boiled with the leaves of the plane tree. It is the first case reported in the literature in which oxalosis developed due to consumption of the leaves of the plane tree.

CASE PRESENTATION

An 81-one-year-old female patient was referred due to complaints of nausea, fatigue, and arthralgia. She stated that she drank water boiled with leaves of the plane tree for approximately a week, after hearing that it would reduce her arthralgia 3 weeks ago. She stopped drinking after seeing that her urine was reddish, which lasted for 3 days. She had diabetes mellitus and hypertension for 10 years. On her physical examination, she had no edema, and her arterial blood pressure was measured as 125/75 mm Hg. Respiratory sounds in both lungs were normal. No tenderness, guarding, and rebound tenderness were present in her abdomen. Organomegaly was not detected. Locomotor system examination revealed that her joint range of motion in bilateral knees was decreased and coarse crepitations were present. Laboratory examination results were as follows: BUN: 131 mg/dL, creatinine: 5.08 mg/dL, hemoglobin: 10 g/dL, hematocrit: 30%, thrombocyte: 380 000/mm^3, albumin: 3.9 g/dL. 24-hours urine protein level was 900 mg. Urine analysis revealed 3 (+) hematuria (50 erythrocytes/hpf). Ultrasound scans showed that renal sizes and contours were normal and that there

was no postrenal pathology. No significant pathology was seen in her chest X-ray.

In her previous analyses, which were evaluated approximately 15 days before her intake of water boiled with the leaves of the plane tree, serum creatinine level was 0.6 mg/dL. On retrospective questioning regarding this date onwards, it was learned that she had not experienced any infective diseases, did not use non-steroidal anti-inflammatory drugs (NSAIDs) and no contrast-enhanced imaging tests were performed on her. Further analyses regarding etiology showed that ANA (antinuclear antibody), anti-ds DNA (anti-double stranded DNA), MPO (myeloperoxidase), PR3 (proteinase 3), ANCA (antineutrophil cytoplasmic antibodies), and anti-GBM (antineutrophil cytoplasmic antibodies) antibodies were negative, and levels of complement-3 and complement-4, immunoglobulin G, A, M were detected to be within the normal range. In her abdominal computed tomography (CT) image, there was no nephrolithiasis, and acido-resistant bacilli (ARB) in 3 consecutive morning urinary samples were detected as negative. No pathology was detected in viral hepatitis serology. Her ophthalmoscopic examination was normal. Renal biopsy was decided for the patient. In her renal biopsy, signs of tubular degeneration and generalized oxalate crystals were detected (Figure 1). No coherent clinical presentations, that is, chronic pancreatitis and inflammatory bowel disease, which could lead to oxalate nephropathy, were present. There was no sign in the abdominal CT favoring chronic pancreatitis. Gastroenterology consultation revealed that the clinical picture, laboratory values, and the imaging results of the patient supported neither chronic pancreatitis nor inflammatory bowel disease and that additional examinations were not needed, and current etiologies could be excluded. The patient did not use orlistat. She did not have a history of surgical operations. She explained that she did not consume food with high oxalate amount and she did not change her dietary habits, but she had increased intake of the plane tree compared with the previous days.

DISCUSSION

Oxalate nephropathy causes acute and chronic tubular degeneration by deposition of oxalate crystals in the tubules and may lead to interstitial fibrosis progressing to renal insufficiency by rearranging connective tissue growth factors in renal tubular cells in addition to stimulating specific genes.[4] Secondary oxalosis may be caused by decreased excretion of oxalate, increased intake, or increased oxalate absorption. The mechanism of increased absorption originates from fat malabsorption, which results in binding of free bile acids to calcium and therefore decreased fecal excretion of calcium oxalate, leading to increased amounts of free oxalate absorption from the colon. Causative conditions can be specified as high dose vitamin C, chronic pancreatitis, inflammatory bowel disease, short bowel, jejunoileal or gastric bypass, orlistat use, which is an inhibitor of gastric and pancreatic lipase, utilized as a medication for losing weight, and cystic fibrosis.[5-9] In one of report, which shows the long-term result of secondary oxalate nephropathy, 12 French patients who developed acute oxalate nephropathy were retrospectively analyzed, and it was observed that end-stage renal disease developed in 3 of them after a median of 7 months.[10] In the pathology of oxalate

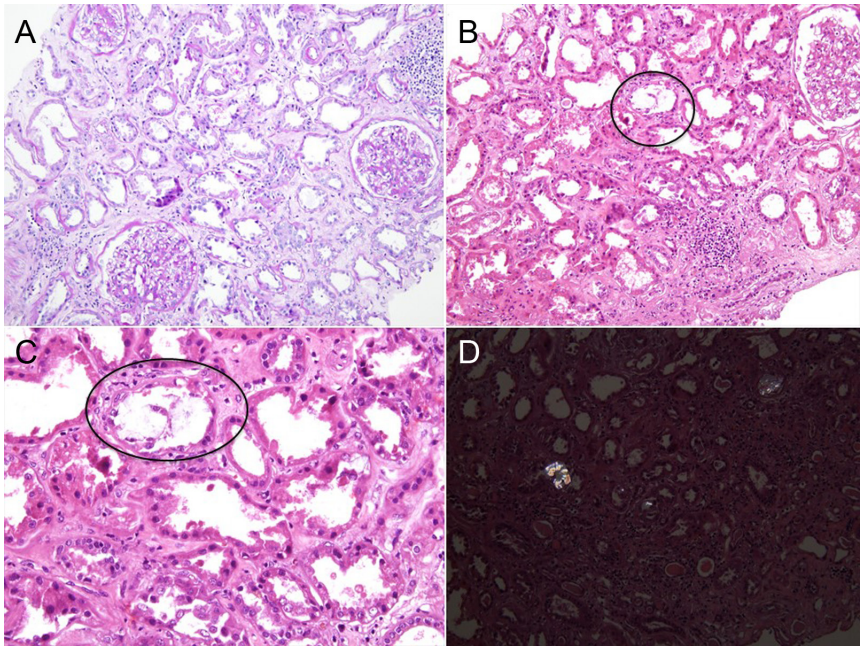

Figure 1. Kidney biopsy findings: Diffuse mesangial enlargement in glomeruli and hyalinization in arterioles (A), epithelial cells in tubules, desquamation, and oxalate crystals (circle) (B and C), and oxalate crystals under polarized light (D).

nephropathy, oxalate crystals are seen in the tubule and/or interstitium.[11] In our patient, the initial value of creatinine was 5 mg/dL. It reached a maximum value of 5.2 mg/dL during follow-up, which was then reduced to 2.1 mg/dL. Ultimately our patient's creatinine level stabilized around 1.5 mg/dL without the need for a dialysis program, and she is currently being followed by our team.

The case presented in this report was diagnosed as secondary oxalate nephropathy considering that the age of beginning renal insufficiency was advanced. When the patient was asked clinical questions in terms of fat malabsorption, she stated that her defecation was regular once every 2 days, she had no abdominal or back pain before, and there was no sign favoring fat malabsorption in her lab. When detailed questioning was made retrospectively regarding food intake before referral to the hospital, it was noted that there was no food intake with excessive amount of oxalate.

CONCLUSION

This is the first case reported as acute kidney injury due to secondary oxalate nephropathy, a rare disease that is caused by the intake of leaves of the plane tree. In patients who are diagnosed with secondary oxalate nephropathy, a history of dietary habits should be taken carefully, and the intake of the leaf of the plane tree should be questioned specifically.

Informed Consent: Written informed consent was received from the patient who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – M.A., O.C.B, H.A.; Design – M.A, O.C.B., H.A., T.Y.; Supervision – M.A., V.T.Y., B.Y., Y.T., İ.S., D.D.; Resource – B.Y., İ.S., D.D.; Materials – T.Y., V.T.Y., Y.T.; Data Collection and/or Processing – M.A., O.C.B, H.A., T.Y.; Analysis and/or Interpretation – M.A., V.T.Y., Y.T., İ.S., D.D.; Literature Search – M.A., O.C.B., H.A., T.Y.; Writing – M.A., O.C.B.; Critical Reviews – M.A., V.T.Y., B.Y., Y.T., İ.S., D.D.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

1. Fang HC, Chen CL, Wang JS, et al. Acute oxalate nephropathy induced by star fruit in rats. *Am J Kidney Dis*. 2001;38(4):876-880. [CrossRef]
2. Nitticharoenpong K, Chalermsanyakorn P, Panvichian R, Kitiyakara C. Acute deterioration of renal function induced by star fruit ingestion in a patient with chronic kidney disease. *J Nephrol*. 2006;19(5):682-686.
3. Sasaki M, Murakami M, Matsuo K, et al. Oxalate nephropathy with a granulomatous lesion due to excessive intake of peanuts. *Clin Exp Nephrol*. 2008;12(4):305-308. [CrossRef]
4. Bakul G, Unni VN, Seethaleksmy NV, et al. Acute oxalate nephropathy due to 'Averrhoa bilimbi' fruit juice ingestion. *Indian J Nephrol*. 2013;23(4):297-300. [CrossRef]
5. Lamarche J, Nair R, Peguero A, Courville C. Vitamin C-induced oxalate nephropathy. *Int J Nephrol*. 2011;2011:146927. [CrossRef]
6. Singh A, Sarkar SR, Gaber LW, Perazella MA. Acute oxalate nephropathy associated with orlistat, a gastrointestinal lipase inhibitor. *Am J Kidney Dis*. 2007;49(1):153-157. [CrossRef]
7. Nasr SH, D'Agati VD, Said SM, et al. Oxalate nephropathy complicating Roux-en-Y Gastric Bypass: an underrecognized cause of irreversible renal failure. *Clin J Am Soc Nephrol*. 2008;3(6):1676-1683. [CrossRef]
8. Karamadoukis L, Shivashankar GH, Ludeman L, Williams AJ. An unusual complication of treatment with orlistat. *Clin Nephrol*. 2009;71(4):430-432. [CrossRef]
9. Hoppe B, Leumann E, von Unruh G, Laube N, Hesse A. Diagnostic and therapeutic approaches in patients with secondary hyperoxaluria. *Front Biosci*. 2003;8:e437-e443. [CrossRef]
10. Cartery C, Faguer S, Karras A, et al. Oxalate nephropathy associated with chronic pancreatitis. *Clin J Am Soc Nephrol*. 2011;6(8):1895-1902. [CrossRef]
11. Lumlertgul N, Siribamrungwong M, Jaber BL, Susantitaphong P. Secondary oxalate nephropathy: a systematic review. *Kidney Int Rep*. 2018;3(6):1363-1372. [CrossRef]