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Review

1124 BP Measurement Techniques: What They Mean for Patients with Kidney Disease

George Thomas and Paul E. Drawz

On the Cover

What's the diagnosis?

A 55 year-old man, originally from Cameroon, with a history of hypertension and Stage 3 CKD attributed to diabetes mellitus, presented with malaise and fatigue. He was diagnosed with AKI with BUN 127 mg/dL and serum creatinine (sCr) 18.9 mg/dL (baseline 1.5 mg/dL). Urinalysis revealed 1 WBC/hpf, no crystals, and urine protein/creatinine ratio 0.16 g/g. Serological testing was negative, and kidney ultrasound showed increased echogenicity. Kidney biopsy revealed numerous intraluminal calcium oxalate crystals consistent with oxalate nephropathy. On further questioning, the patient reported ingesting multiple unknown herbal bowel cleansing regimens while in Africa. He was initiated on hemodialysis with eventual kidney recovery by 8 weeks. No genetic testing was pursued. Follow-up sCr was 3.49 mg/dL (eGFR 22 ml/min per 1.73m²) off dialysis.

Light microscopy revealed 20 glomeruli, of which 5 were globally sclerotic. Patent glomeruli were normocellular without mesangial expansion. Moderate acute tubular injury was present. Numerous translucent crystals were present in tubule lumens and in epithelial cell cytoplasm that were birefringent under polarized light (H&E, Figure 1; silver, Figure 2). Diffuse interstitial edema was present in association with 20 – 25% tubulointerstitial fibrosis. IF and EM were unrevealing.

Primary hyperoxaluria results from autosomal recessive mutations in *AGXT*, *GRHPR*, or *HOGA1*. Secondary hyperoxaluria, as in this patient, has numerous etiologies and remains an uncommonly diagnosed cause of AKI. Etiologies of acquired oxalate nephropathy include increased dietary oxalate intake, ethylene glycol toxicity, fat malabsorption, vitamin C supplementation, and B6 deficiency. In contrast, calcium phosphate crystals are blue to purple on H&E, react with von Kossa stain, and are not birefringent.

(Images and text provided by Javier Rodriguez-Sanchez, MD; Mohamad Hanouneh, MD; and C. John Sperati, MD, MHS, Johns Hopkins University, Department of Medicine, Division of Nephrology, Baltimore, Maryland)