

Hyperoxaluria: An under-appreciated cause of kidney stones and kidney disease

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Abstract

The prevalence of kidney stones is high and stone formation is associated with CKD and end stage kidney disease. High concentrations of oxalate in the urine pose risk not only for calcium oxalate urolithiasis, but also for kidney disease caused by deposition of calcium oxalate crystals in kidney tubules and interstitium. Crystal induced inflammation and subsequent fibrosis can cause chronic progressive, or acute, loss of kidney function. Gut flora play a role in bioavailability of oxalate in the intestinal lumen and a number of disease states increase oxalate absorption from the gut. Any intestinal disease that impairs fat absorption, such as Crohn's disease, pancreatic insufficiency, or short bowel syndrome can lead to enteric hyperoxaluria. Management of the epidemic of obesity is increasing the frequency of enteric hyperoxaluria through use of medications such as orlistat and increasing numbers of gastric bypass procedures performed in many parts of the world. Mal-absorptive procedures, more effective for weight loss, are associated with hyperoxaluria and stones. Inherited forms of primary hyperoxaluria result in the highest urine oxalate observed in human disease. The hyperoxaluria is life-long and kidney failure is frequent. Three types of primary hyperoxaluria have been recognized. They differ in the severity of hyperoxaluria and stone disease and in the frequency of end stage kidney disease. Kidney stones and kidney failure related to hyperoxaluria are increasingly recognized. Mechanisms of kidney injury, treatments available and under investigation and clinical management of patients with advanced oxalate related kidney disease will be discussed.

Biography

Dawn S Milliner is a member of the Divisions of Nephrology and Pediatric Nephrology, Departments of Internal Medicine and Pediatrics at the Mayo Clinic College of Medicine. She conducts research in pediatric stone disease, oxalate and inherited forms of nephrolithiasis. She chaired the Seventh International Workshop on Primary Hyperoxaluria, served as chair of the Scientific Advisory Board of the Oxalosis and Hyperoxaluria Foundation and is past President of the Research on Calculus Kinetics Society. She is the Medical Director for the Mayo Clinic, Hyperoxaluria Center and is Principal Investigator for the Rare Kidney Stone Consortium, funded by the NIH.