

Beware Being Reflexive With Anti-Refluxives!

A Case Of Omeprazole-Associated Acute Interstitial Nephritis

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Introduction

Acute Interstitial Nephritis (AIN) is characterized by an inflammatory infiltrate of kidney interstitium that typically causes a decline in kidney function. AIN is a common cause of acute kidney injury (AKI), accounting for 15-20% of all AKI's. Possible etiologies of AIN are drugs, infections, autoimmune diseases, with drug-induced interstitial nephritis as the most common. Common drugs associated with AIN are antibiotics and proton pump inhibitors (PPIs). A known adverse effect of PPIs is AIN, with omeprazole showing a prevalence of 6 per 10,000. A definitive diagnosis of AIN is made by kidney biopsy.

Case Presentation

A 59-year-old male s/p laparoscopic robotic sleeve gastrectomy and hiatal hernia repair presented with fatigue, dizziness/lightheadedness, and abnormal outpatient labs showing elevated creatinine and anemia. The patient had gastric surgery 8 weeks prior and started taking Omeprazole 20mg PO once daily after surgery. The physical exam was unremarkable.

Basic Metabolic Panel		Urinalysis (pertinent findings)	
Sodium	138 mmol/L	WBC	5
Potassium	3.6 mmol/L	RBC	0
Chloride	107 mmol/L	Glucose	150 mg/dL
CO2	21.1 mmol/L	Ketones	10 mg/dL
Glucose	115 mg/dL	Protein	100 mg/dL
BUN	41 mg/dL	Hyaline casts	3
Creatinine	4.19 mg/dL	Eosinophils	Few
Calcium	9.2 mg/dL	Urine Sodium	77 mmol/L
Anion Gap	10 mmol/L	Urine Osmolality	422 mOSMIK
Eosinophil count	0.39 10E3/u		
C3 level	113 mg/dL		
C4 level	38.4 mg/dL		
ANA screen	Negative		
ANCA screen	Negative		
IgM	381 mg/dL		
Kappa free light chain	89.9 mg/dL		
Kappa/lambda free light chain ratio	3.76		

Complete Blood Count	
WBC	7.1 10E3/uL
RBC	3.05 10E6/uL
Hemoglobin	9.0 g/dL
Hematocrit	28.5%
Platelets	288 10E3/uL

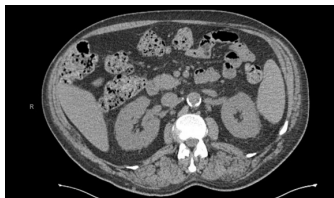


Figure 1. Computed Tomography of the abdomen and pelvis revealed no renal calculi, no hydronephrosis, and no ureteral calculus.

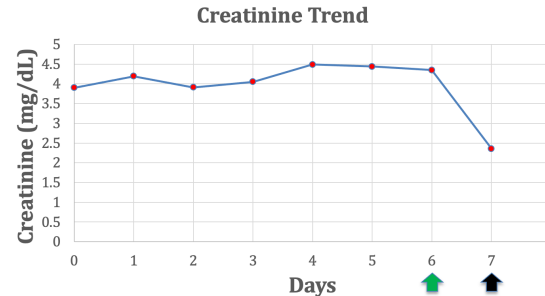
Initial Imaging:
Renal ultrasound and duplex were unremarkable, demonstrating non-atrophic kidneys bilaterally.

Clinical Course

Initial Management

- Initially thought to be a pre-renal AKI due to dehydration and poor oral intake after surgery
- Creatinine improved to 3.91 after administering IV fluids
- Creatinine increased to 4.05 the following day, and a renal biopsy was scheduled

Figure 2. Creatinine trend during hospitalization. Day 0 is the value from outpatient lab work. The patient was discharged on day 6 (green arrow). Day 7 (black arrow), marks the completion of 7-day Prednisone course.



Biopsy Results

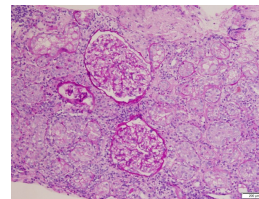
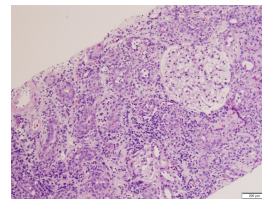


Figure 3 (Top Left), Figure 4 (Top middle). Glomeruli are normal with open loops and smooth capillaries. Background shows diffuse interstitial edema with inflammatory infiltration.

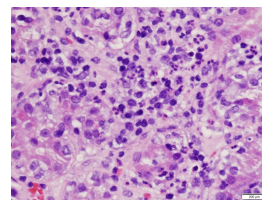


Figure 5 (bottom left). Inflammatory reaction with lymphocytes and neutrophils, rare eosinophils

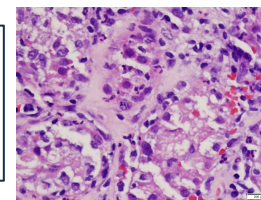


Figure 6 (bottom right). Focal tubulitis, neutrophils are seen in the tubules with epithelial cell injury

Discussion

- The first case of omeprazole-associated acute interstitial nephritis was reported by Ruffenanch *et al.* in 1992.
- It is well documented that AIN is an adverse effect of proton pump inhibitors and should be considered in the differential diagnosis of an AKI patient on medications known to cause drug-induced AIN.
- AIN can be difficult to diagnose, presenting with nonspecific symptoms such as oliguria, malaise, nausea, and vomiting. Physician awareness can increase early recognition of this hypersensitivity reaction. An accurate and timely diagnosis can help prevent worsening renal failure.
- Consider the diagnosis in a patient with increased creatinine and a urine analysis showing WBC and eosinophiluria. Diagnosis is confirmed with biopsy.

Management after biopsy:

The patient received an initial IV dose of Methylprednisone 40mg and completed a 7-day course of Prednisone 40mg PO.

Sources

- Roulet JA, Fischer SA. Acute interstitial nephritis. In: Comprehensive Clinical Nephrology, 2, Johnson RJ, Heffaly J (Eds). Elsevier Limited, Philadelphia 2003. Vol 1, p.769.
- Raghavan R, Elkoyan G. Acute interstitial nephritis - a reappraisal and update. Clin Nephrol. 2014;82(3):149-162. doi:10.5414/cn.108386
- Noik RH, Annamraju P. Interstitial Nephritis. [Updated 2023 Jan 15]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK555436/>
- Ta A, Toke SW. Acute interstitial nephritis due to pantoprazole. Ann Pharmacother. 2004;38(1):41-45. doi:10.1345/aph.1.02085
- Trujillo, Sophie DO1, Desai, Aakash MD1, Dalal, Shantanu MD1, Sandhu, Dalbir S. MD2. 51341 Risk of Acute Interstitial Nephritis in Patients on Acute Proton Pump Inhibitor Therapy. The American Journal of Gastroenterology 115(10):1676-1677, October 2020. | DOI: 10.14399/ajg.19000070412.89139.07
- Ruffenanch SJ, Stokind MS, Lien YH. Acute interstitial nephritis due to omeprazole. Am J Med 1992;93(4):472-473. doi:10.1016/0002-9343(92)90181-a