Acute Kidney Injury And Hemophagocytic Lymphohistiocytosis Associated With Human Granulocytic Anaplasmosis

Tuan Vu[1], Eric Yau, Ph.D.[1] , Ereny Demian, M.D.[2] , Max Greenberg, M.D.[2], Nasrollah Ghahramani, M.D.[3], Erik Washburn, M.D. [4], and Wilbert Beachy, M.D.[5]

1. Penn State College of Medicine, Penn State Health Milton S. Hershey Medical Center, PA, USA.
2. Department of Medicine, Penn State Health Milton S. Hershey Medical Center, PA, USA.
3. Department of Medicine, Division of Nephrology, Penn State Health Milton S. Hershey Medical Center, PA, USA.
4. Department of Pathology, Penn State Health Milton S. Hershey Medical Center, PA, USA.
5. Department of Medicine, Division of Hospital Medicine, Penn State Health Milton S. Hershey Medical Center, PA, USA.

Introduction

- Renal involvement and hemophagocytic lymphohistiocytosis (HLH) are rare manifestations of anaplasmosis. We present an atypical case of anaplasmosis with presentation consistent with acute kidney injury and features suggestive of HLH.

Case

- A 67-year-old male Pennsylvania resident with a medical history of A-fib, type 2 diabetes, and history of alcohol use disorder presented in June with a 2-day history of severe fatigue, fever of 39.1ºC and mild generalized headache. He had no personal or family history of chronic kidney disease. He denied new medications, NSAID use or herbal supplements. While his house is surrounded by a wooded area, he did not recall recent tick bites.
- **Vitals:** T-39.1ºC; HR-110; BP-123/67
- **Physical Exam:** mild confusion, mild splenomegaly, but otherwise unremarkable
- **Laboratory Results:**

Test	Day 1	Day 3	Day 9	Day 14	2-wk post D/C
Hemoglobin, g/dL	14	13.2	11	11.9	
WBC count, ×10^3 /µL	2.87	2.39	6.03	6.57	
Platelet , ×103/µL	61	20	204	260	
Peripheral smear	Normal				
Serum Urea, mg/dL	39	88	96	85	29
Serum Crea, mg/dL	1.92	5.89	7.36	4.26	1.65
ALT, IU/L	92	154	52	37	
AST, IU/L	172	398	46	26	
ALP, IU/L	133	147	102	90	
Triglyceride, mg/dL	274				
LDH, IU/L	1594				
Haptoglobin, mg/dL	135				
Ferritin, ng/mL		21991			
CRP, mg/dL	29.4				

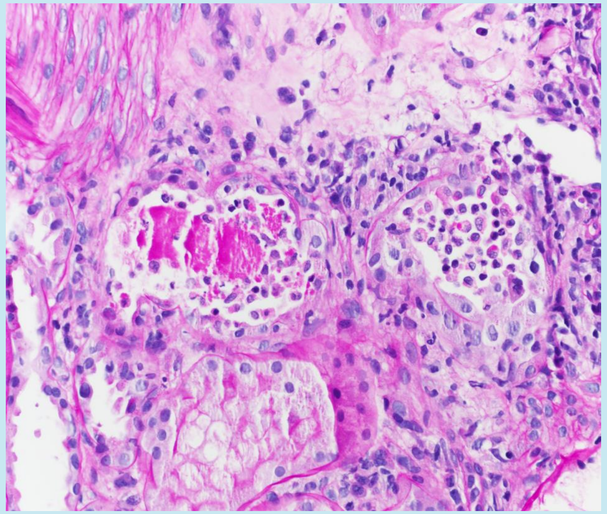

Figure 1. Histologic sections reveal focal areas of loss of the brush border within the renal tubules. There are sloughed necrotic cells and intraluminal granular debris, compatible with **acute tubular injury**. (PAS; 200X)

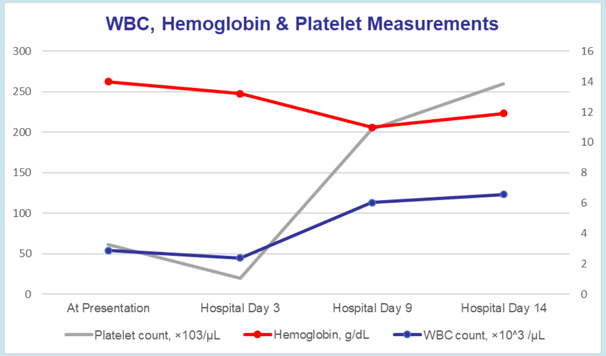

Figure 3. White blood cell, Hemoglobin and Platelet measurements

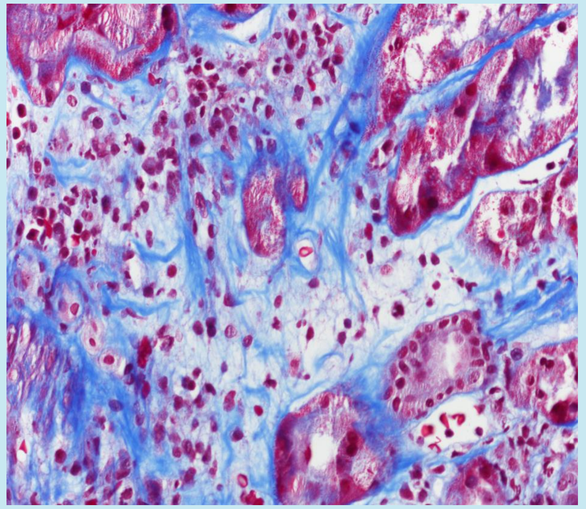

Figure 2. A trichrome stain shows patchy areas of interstitial edema and chronic inflammation consisting of lymphocytes and plasma cells. The features are diagnostic of **interstitial nephritis**. (Trichrome; 200X)

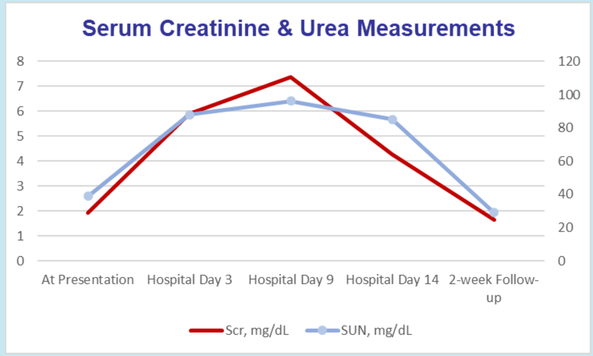

Figure 4. Serum creatinine and Urea measurements

2004 Hemophagocytic Lymphohistiocytosis Diagnostic Criteria

A. A molecular diagnosis consistent with HLH or-
B. Any 5 of the 8 following clinical & laboratory criteria for HLH:
1. Fever >38.5 C
2. Splenomegaly
3. Cytopenia (≥2 of 3 lineages in peripheral blood):
   - Hemoglobin <9 g/dL (in infants <4 weeks: Hb <100 g/L)
   - Platelets $<100 \times 10^9$/L
   - Neutrophils $<1.0 \times 10^9$/L
4. Hypertriglyceridemia and/or hypofibrinogenemia: triglycerides >3.0 mmol/L (>265 mg/dL) or fibrinogen ≤1.5 g/L
5. Hemophagocytosis in bone marrow, spleen, liver, lymph nodes, or other tissues
6. Low or absent natural killer (NK) cell activity
7. Serum ferritin concentration ≥500 µg/L
8. Soluble CD25 (soluble IL-2 receptor) ≥2400 U/mL

Management

- A 10-day-course of doxycycline was started on hospital day 1
- Broad malignancy, rheumatologic and infectious workup was obtained which was only remarkable for positive qualitative PCR for ***Anaplasma phagocytophilum.***
- Due to the severe degree of hyperferritinemia, HLH was also considered as a diagnostic possibility. His **H-Score** was calculated at **213** with **HLH probability of 94%.**
- Given degree of interstitial nephritis and elevated creatinine, he was started on treatment with prednisone, 60 mg daily, with a planned 2-week taper.

Discussion

- The manifestations of anaplasmosis can rarely overlap with HLH and other causes of inflammatory syndrome, high index of suspicion for HGA must remain high for prompt testing and appropriate treatment.

References

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- Scribner J, […] Villanueva DD. Anaplasmosis-Induced Hemophagocytic Lymphohistiocytosis: A Case Report and Review of the Literature. Open Forum Infect Dis. 2023;10(5):1-5. doi:10.1093/ofid/ofad213