Atypical Hemolytic Uremic Syndrome: A Diagnostic Conundrum

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INTRODUCTION

- Hemolytic uremic syndrome (HUS) is a thrombotic microangiopathy typically characterized by thrombocytopenia, acute renal impairment, and microangiopathic hemolytic anemia.
- While this triad is associated with typical HUS, the presentation can vary based on the etiology of the disease. It most commonly occurs after certain bacterial infections, but can also be familial or associated with pregnancy and postpartum period.
- The prognosis of patients with HUS is largely dependent on prompt recognition and diagnosis of the disease, coupled with early initiation of treatment.

CASE PRESENTATION

- Patient is 21 year old male with a history of mild psoriasis and childhood asthma who presented with 1 week of nausea, vomiting, and diarrhea. Prior to admission he also had an episode of hematemesis and was seen at an urgent care without intervention. He takes no medications at home.
- Pertinent labs at outside hospital: **Hgb 5.4, PLT 85, BUN 537, Cr 95.4**. He was transfused 2 units of PRBCs prior to transfer.
- Pertinent labs at our hospital: **Hgb 6.4, PLT 86, BUN 217, Cr 38.2**. He was transfused 2 units of PRBCs at our hospital.
- Dialysis catheter placed and urgent hemodialysis was started. Plasma Exchange was initiated.
- Ultimately, his peripheral blood smear showed no signs of microangiopathic hemolytic anemia.
- His ADAMTS activity was 73.5 and his ADAMTS13 Ab was 3. Haptoglobin < 8, Reticulocyte Count 2.8%, C3 level was 78.5, C4 level 34.7
- Renal Biopsy showed thrombotic microangiopathy, advanced focal and segmental glomerulosclerosis, and acute tubular injury w/ myoglobin casts. There was also severe interstitial fibrosis and tubular atrophy noted.
- Started on eculizumab as an inpatient, then transitioned to ravulizumab as an outpatient.

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Figures and Imaging

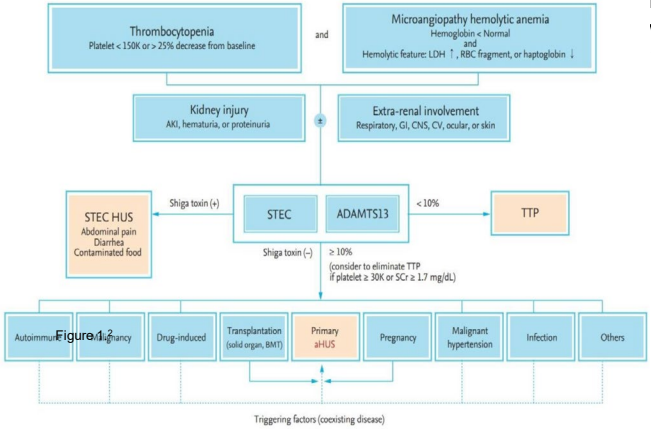
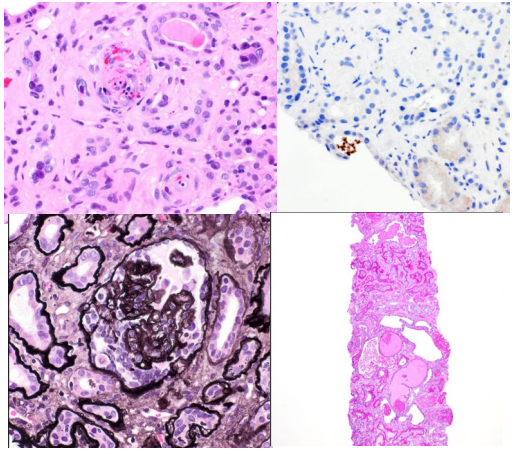


Figure 1, 2



DISCUSSION

Hemolytic uremic syndrome (HUS) is a thrombotic microangiopathy with two variants: STEC-HUS and atypical HUS

Shiga-like toxin of *Escherichia Coli O157:H7* strain or Shiga-toxin of *Shigella dysenteriae* are responsible for typical variant

Atypical variant HUS is primarily complement-mediated, many times due to genetic mutations and encompass all cases not attributed to Shiga toxin

Almost half atypical HUS cases are associated with *Streptococcus pneumoniae*. Other triggers of atypical HUS include *Mycoplasma pneumoniae, Clostridium difficile,* HIV, histoplasmosis, coxsackievirus, H1N1 influenza A, mitomycin C, cyclosporine, cisplatin, cocaine, quinine, tacrolimus and IFN-a

HUS requires high degree of clinical suspicion to diagnose and labs will reveal anemia, thrombocytopenia, and schistocytes on blood smear. Elevated total bilirubin and LDH with low haptoglobin indicate hemolysis with a negative Coombs test

Encephalopathic patients or those needing dialysis should be admitted to the ICU. Plasmapheresis will benefit patients with familial variant

CONCLUSION

- The incidence of typical HUS is 3 cases per 100,000 in the United States. The incidence of atypical HUS is 10 per 1,000,000 in the United States.[3]
- This patient's case was atypical as he had low C3 level, no findings of Shiga toxin and normal ADAMTS13 activity level
- Through our poster and our case we aim to increase the awareness of atypical HUS and aid in the early diagnosis of this condition.

REFERENCES

1. *Hemolytic uremic syndrome associated with invasive pneumococcal disease: 2007. Waters AM, Kerecuk L, Luk D*
2. *Lee H, Kang E, Kang HG, et al. Consensus regarding diagnosis and management of atypical hemolytic uremic syndrome. Korean J Intern Med. 2020 Jan;35(1):25-40. doi: 10.3904/kjim.2019.388. Epub 2020 Jan 2. PMID: 31935318; PMCID: PMC6960041.*
3. *Hemolytic Uremic Syndrome. 2022. Jesih Bhandari, Yub Raj Sedhai.*