SICKLE CELL-INDUCED CHOLESTASIS: A RARE BUT FATAL COMPLICATION OF SICKLE CELL DISEASE

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Background

Sickle cell disease (SCD) is a group of inherited red blood cell (RBC) disorders in which RBC morphology is altered, resulting in a sickled shape. This causes vascular occlusion and ultimately systemic organ dysfunction. Patients with SCD develop functional asplenia, predisposing them to many different infections. Given the numerous complications, the estimated median age of death is 43 years in the United States. The only curative treatment to date is a hemopoietic stem cell transplant.

Here, we present a rare complication of sickle cell disease, **sickle-cell induced cholestasis (SCIC), a rare but fatal diagnosis with an estimated mortality as great as 50% in adults**, which results from RBCs sickling within hepatic sinusoids, causing vascular stasis, and hypoxia.

Case Presentation

Patient Background:

- 32 year old female with a history of sickle cell disease and prior cholecystectomy; tested COVID-19+ one month prior
- Presents to ER with fevers (T-max 102°F), abdominal pain, cough of 6 days duration; and loose stools, sore throat and diffuse body aches of 3 days duration
- Previously saw PCP via telehealth and was diagnosed with sinusitis and started on guaifenesin

Hospital course:

- Upon presentation to the emergency room, received IV morphine for pain, after which patient became hypotensive, refractory to aggressive fluid repletion
- Started on broad spectrum antibiotics and vasopressors
- Admitted to ICU for suspected septic shock
- Initial 24 hour course:
    - Leukocytosis to 39.7 THO/uL
    - Worsening anemia (5.6-6.4 mg/dL) refractory to simple transfusions
    - Worsening liver function tests (LFTs)
    - Ultrasound and CT scan showing mild intrahepatic and proximal extrahepatic bile duct dilation and hepatomegaly
- Given constellation of symptoms and findings, concern for **SCIC**

Impact of Red-Cell Exchange Transfusion

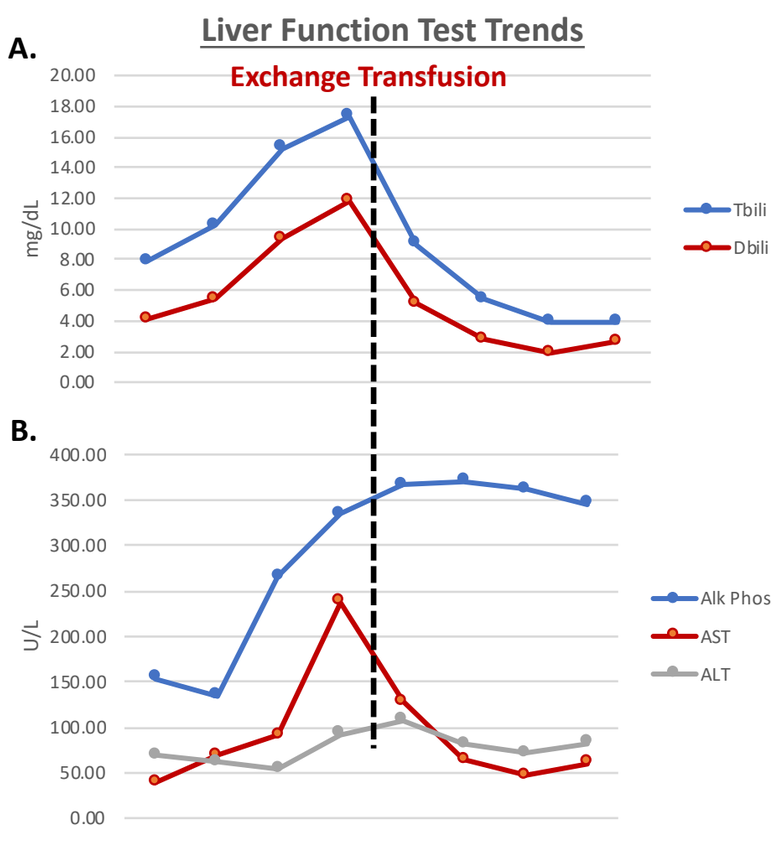

Figure 1: Liver Function Test Trends

1A. Highlighting changes in total bilirubin (Tbili) and direct bilirubin (Dbili) prior and following exchange transfusion, measured in mg/dL.

1B. Highlighting changes in alkaline phosphatase (Alk Phos), aspartate transaminase (AST), alanine transaminase (ALT), measured in U/L.

Case Presentation (cont'd)

Management:

- Limited data regarding management; no established guidelines given rarity
- Exchange catheter placed by interventional radiology
- Total 5 units of RBCs ordered for exchange

Following exchange:

- Pressor requirements decreased within hours
- Improvement in LFTs following exchange (Figure 1)
- Leukocytosis and anemia improving/stabilizing
- Mental status improvement

Additional workup (not all results available at time of diagnosis):

- Infectious workup negative, including blood cultures and testing for hepatitis B, hepatitis C, HIV, parvovirus IgM, Epstein-Barr Virus, and cytomegalovirus
- Rheumatological workup was also negative

Follow-up:

- Patient discharged 4 days later, doing well in outpatient setting

Discussion

- SCIC typically manifests with **abdominal pain, acute hepatomegaly, coagulopathy and profound hyperbilirubinemia, with direct bilirubin being the predominant form**
- Data and literature about this disease are limited, though several case reports suggest that **early blood exchanges initiated early in the patient's course results in the best outcomes**
- Given the rarity of this pathology diagnosis requires a high index of suspicion

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