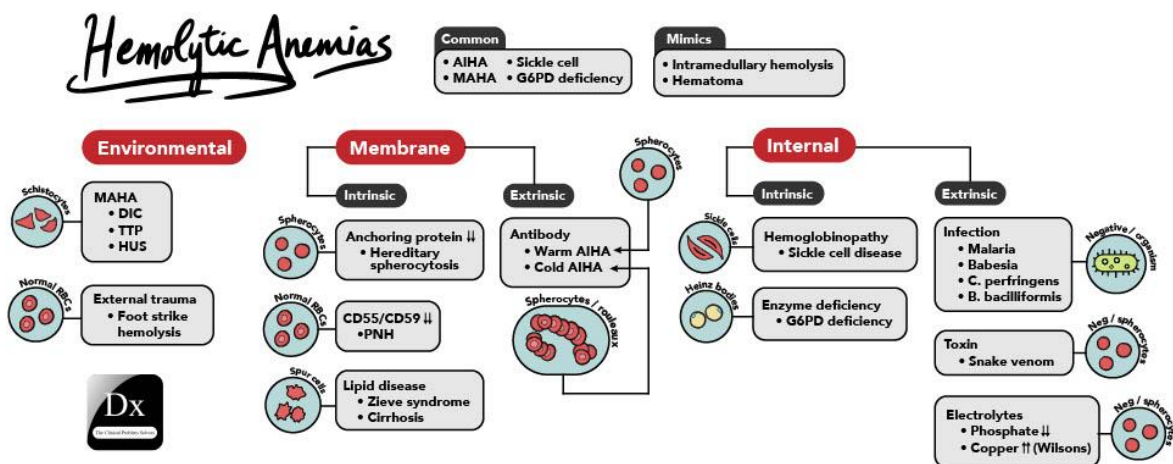


Episode 304 Recap

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This week, the [CPSolvers](#) featured an episode from the [Spaced Learning Episode](#) of a case of a young man who initially presented with anorexia and jaundice in the setting of recent increased alcohol intake. He was diagnosed with alcoholic hepatitis, for which he was started on steroid and dapsons for PJP prophylaxis. He later re-presented with dyspnea on exertion and was found to have low oxygen on pulse oximetry that did not improve with supplemental oxygen. He was eventually diagnosed with dapsons-induced methemoglobinemia. He also developed hemolytic anemia, likely due to dapsons in the setting of underlying G6PD deficiency.



Teaching points

Approach to hypoxia

- First, check the pulse oximetry and waveform. (Cautious about [Racial Bias](#) in pulse oximetry reading resulting in potentially lower reading in patients of darker skin tone).
- Next, check if O₂ sat dramatically improves with minimal supplemental O₂
 - Yes -> suggests preserved A-a gradient (eg. low inhaled O₂ content, opioid overdose, asthma/COPD)
 - No -> suggests impaired A-a gradient due to alveolar or vessel problems
 - Alveolar problem: pneumonia, pulmonary edema, atelectasis, pneumothorax

- Vessel problem: Pulmonary AVM, PFO, PE (typically with concurrent shock, heart failure, or R to L shunt)

Methemoglobinemia

- Pathophysiology: altered hemoglobin where the heme iron is oxidized from ferrous (Fe 2+) to ferric (Fe 3+), which has low O₂ binding affinity.
- Causes:
 - Congenital: mutation causing deficiency in cytochrome b5 reductase (Cyb5R) or hemoglobin M disease.
 - Acquired: Often medication-induced, including dapsone, chloroquine, topical benzocaine, inhaled nitric oxide, and rasburicase.
- Clinical clues: SpO₂ ~ 85% that does not respond to supplemental oxygen without hypoxemia (normal PaO₂), cyanosis, and darkbrown-colored arterial blood.
- Treatment:
 - Supportive care with supplemental O₂
 - Medical treatment indicated in symptomatic patients with methemoglobin level > 30%.
 - Methylene blue: avoid in G6PD deficiency or concurrent serotonergic medication
 - Ascorbic acid

Hemolysis due to acanthocytosis in cirrhosis

- Acanthocytes (spur cells) are erythrocytes with few spicules of various sizes. This is in contrast with bur cells (echinocytes), which have blunter spicules that are more uniform in size. When acanthocytes are remodeled by the spleen, the spicules become blunter, making the cells more spherocytic (spherocanthocytes).
- Acanthocytes are associated with advanced liver failure or cirrhosis due to impaired lipid metabolism and altered cell membrane compositions. This altered red cell membrane integrity leads to hemolytic anemia.
- The presence of acanthocytes in cirrhosis is a poor prognostic factor associated with median survival of < 3 months.

CPS Emails Team

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