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Not All Anemias in Training Room Need Iron Replacement

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References:

Case History

- 23 y/o baseball player presents to training room to discuss his PPE lab work. He was told by his ATC that he was anemic, and he should talk to the team physicians about possible iron supplements. His initial labs showed a microcytic anemia.
- No personal or family history of anemia or other blood disorders; previous negative Sickledex at his prior university. Not on any medications or supplements.
- Denies any fatigue or shortness of breath during workouts over the summer. Denies any headaches, dizziness, joint pain/swelling, palpitations, hematochezia, or melanotic stool.
- Diet well balanced consisting of green leafy vegetables and ample amounts of protein including red meat.
- Denies any recreational drug use or smoking. Social drinker (1-2 beers on the weekend). No binge drinking.

Physical Exam

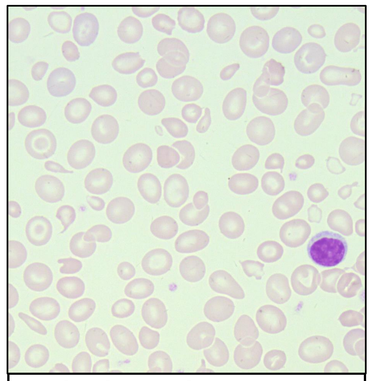
- Vitals: Ht 68 in, Wt 165 lbs, HR 58, RR 14, BP 110/70
- HEENT: Normocephalic, atraumatic head. Normal conjunctiva and sclera. Moist mucous membranes. No oral lesions. TMs clear. No lymphadenopathy.
- Cardiovascular: Regular rate and rhythm. No murmurs/rubs/gallops.
- Respiratory: Clear to auscultation bilaterally. No adventitious lung sounds.
- Abdominal: Soft, non-tender, non-distended. Bowel sounds present. No hepatosplenomegaly.
- Neuro: CN 2-12 intact. Normal strength and sensation in all myotome and dermatomes. All extremity reflexes +2.
- Skin: No significant skin lesions. No petechia. Normal nails.

Differential Diagnosis

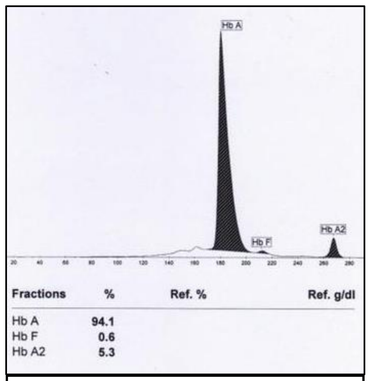
1. Iron Deficiency Anemia
2. Anemia of chronic disease
3. Alpha thalassemia
4. Beta thalassemia
5. Alcohol induced anemia

Workup

Repeat CBC	BMP	Iron & Misc. Studies
○ WBC 5K w/ normal differential	○ Na 140	○ Ferritin 116
⇩ **Hgb 12.5**	○ K 4	○ Transferrin 244
○ Hct 40%	○ Cr 1.25	○ Iron Sat 39%
⇩ **MCV 62.5**	○ GFR 84	○ CRP < 0.1
⇧ **RDW 17.7%**		○ Vit D 47
○ Plt 185K		○ **Retic count elevated**



Peripheral smear demonstrating characteristic target cells and teardrop cells



Hemoglobin electrophoresis demonstrating elevated Hb A2 with <1% of Hb F

Final Diagnosis

Beta Thalassemia Minor

Discussion

- Approximately 80-90 million people are beta thalassemia minor carriers worldwide
- Athletes with beta-thalassemia minor produce sufficient hemoglobin to supply oxygen demands under normal conditions
- However, they are more susceptible to exercise-induced inflammation and hemolysis leading to an acute decrease in hemoglobin levels
- Previous studies have shown that beta-thalassemia can decrease anaerobic conditioning with little effect on aerobic conditioning

Outcome

- Patient received counseling on diagnosis including a reproductive counseling that any future children may have a more severe, symptomatic form of beta thalassemia
- Patient was advised against iron supplementation without being under the care of a provider
- Repeat CBC obtained 1 month later demonstrating resolution of anemia with continuation of microcytosis

Return to Play

- The patient was cleared for full physical activity and athletic participation without restriction
- Strict return precautions for symptoms concerning for exertional anemia were reviewed
- Continues to participate in all baseball activities without issue or symptoms of anemia