


NP BOARDS review

Anemias

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Table of Content

Terminology

Types of Anemia

Iron deficiency anemia (IDA)

Thalassemia

Anemia of chronic disease

b12 deficiency

folic acid deficiency

IDA vs thalassemia

Must Knows Tips

Terminology

Mean Corpuscular Volume (MCV): size of red blood cell (RBC). Normal 80-100.

Mean Corpuscular Hgb Concentration (MCHC): Measures color. Decreased in iron deficiency anemia (IDA) & thalassemia

Mean Corpuscular Hemoglobin (MCH): color

Total iron-binding Capacity: Measure of available transferrin that is left unbound to iron. Increased ONLY on IDA.

Serum Ferritin: stored, most sensitive test for IDA.

Reticulocytes: Immature RBC.

Poikilocytosis: Variable shapes of RBC.

Types of Anemia

MIRCO MCV <80	MACRO MCV >100
IRON DEFICIENCY ANEMIA (IDA) *most common*	Pernicious
thalassemia	Folate
	B12

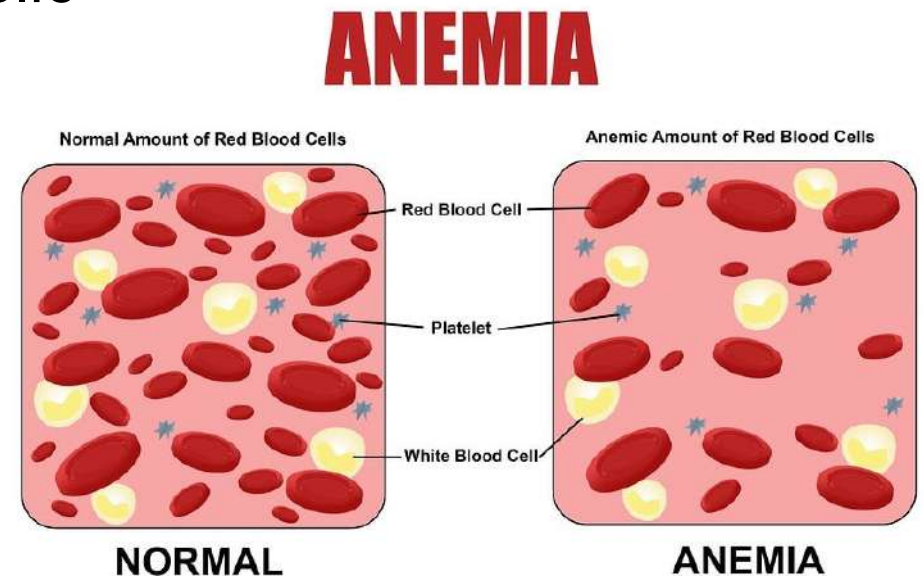
IDA

- **Cheilosis:** fissures at the corners of the mouth, or angular stomatitis.
- **Koilonychia:** spooning of the fingernails.
- **Atrophic glossitis:** red, glazed, smooth tongue.
- **Pica and pagophagia:** perverted appetite to clay or dirt (geophagia), paper products, or starch (amylophagia), ice.



Iron Deficiency Anemia

- Micro/Hypochromic (small and pale).
- **Cause:** iron deficiency.
- Most common type of anemia.
- **Presentation:** Pallor (skin, conjunctiva, nail beds), fatigue, glossitis, cheilitis, pica, koilonychia, systolic murmurs, tachycardia, heart failure.



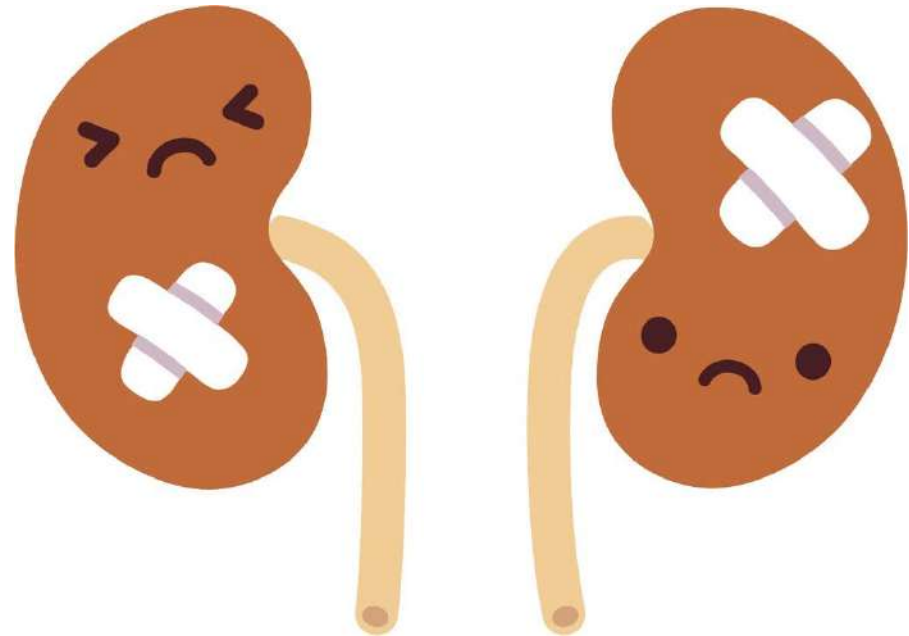
Thalassemia

- Genetic, inherited: body makes defective RBC. “Mediterranean anemia”. It is commonly found in people of Mediterranean ancestry, such as Italians, Greeks, Turks.
- Majority are asymptomatic, discovered accidentally CBC.
- RBC might be elevated*
- **Gold standard diagnostic test:** hemoglobin electrophoresis.



Anemia of Chronic Disease

- **Cause:** Old age. Hypo-proliferative, normocytic, normochromic (the body simply doesn't make enough).
- Decreased renal Epoetin (EPO).



B12 deficiency Anemia

- **Cause:** B12 deficiency (malabsorption such as with gastric bypass surgery, culture/nutrition such as vegans or Indian culture).
- Pernicious anemia results in B12 deficiency.
- **Complications:** nerve damage (peripheral neuropathy), brain damage (dementia).
- **Classic case:** older woman c/o numbness and tingling of hands or feet that is slowly progressive. Tells you she has trouble buttoning shirts. Skin is pale, conjunctiva pale. Glossitis.
- Always check B12 and folate together. Folate can increase Hgb and Hct but B12 deficiency is treated with B12 supplementation.



Folic Acid-Deficiency Anemia

- Deficiency in folate results in damage to the DNA of RBC.
- **Cause:** low folic acid (aka folate or vitamin B9).
- Does NOT cause neurological damage.
- Most common cause: inadequate dietary intake (infants, elderly, **alcoholics**, pregnancy, malabsorption, drugs).
- **Presentation:** elderly patient, alcoholic, c/o fatigue, pallor, red and tender tongue, no neurological complaints, tachycardia.
- CBC: decreased Hgb, Hct, increased MCV.
- Food sources: leafy green vegetables, grains, beans, liver.
- **Treatment:** folic acid. **If pregnant, 400mcg daily to prevent neural tube defects.**

IDA vs Thalassemia

IDA	Thalassemia
RBC ↓ Hgb ↓ Hct ↓	RBC normal or ↑
Unusual GI bleed	Inherited body makes abnormal RBC= anemia
Tx: iron supplementation	Don't give iron supplementation. They have normal RBC or ↑
Hemoglobin electrophoresis NORMAL	Hemoglobin electrophoresis ABNORMAL
Ethnicity or age does NOT matter	Asians, Mediterranean, North Africa, Middle East.

IDA vs Thalassemia

IDA	Thalassemia
Ferritin ↓	NORMAL or ↑
Hgb, Hct ↓	NORMAL
Serum iron ↓	NORMAL or ↑
TIBC ↑	NORMAL
MCHC ↓	NORMAL

Must know!

- First test for all anemias is CBC (hgb/hct)
- Diagnostic test: hemoglobin electrophoresis (It measures hemoglobin levels and looks for abnormal types of hemoglobin)
- Ferritin low = IDA
- Ferritin normal or elevated = thalassemia
- Wait 4 hrs. between antacids and iron supplementation
- Iron interacts with tetracyclines, levothyroxine, bisphosphonates (decreases effectiveness)
- Failure to respond and compliant treatment → reassess for blood loss!!!
- Patient c/o neuropathy or dementia MUST get tested for B12 levels
- MCV >100 → order both B12 and folate levels.
- Pernicious anemia results in B12 deficiency
- **Cow's milk is much lower in iron than breast milk and formula. Infants who are fed cow's milk are at an increased risk for developing anemia or other iron deficiency disorders.**

THE END

For study tips and visuals



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Email me any time with questions at Shaira@thecohenreview.com