Pharmacotherapy 2

أُسابِقُ السَّاعات؛ لِأنهي ما عَلَيَّ من مَهام، ويتردَّد على أُذني صوت الشَّيخ بَدر:
"نحن مُسلمون نُعوِّلُ على البَركةِ لا على الوقت".

Anemia

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ملاحظة :
نفس السلايد كوبي بيست لكن على صفحات مشان يكون في مكان للكتابه

Final %-

* عشان احكي انت مريض Anemia لازم يكون Low Hgb
بغض النظر عن السبب ، acute , chronic . . .

* تصنف حسب السبب etiology وبالتالي يختلف علاجها .

* كونها Low Hb هي اشبه بال sign وليس Disease

- هي ليست Disease بحد ذاتها فمثلاً : مريض PUD
وكانت complecated وتنزف هنا ال condition يلي عنده
disease
ال red flag ال ال animea .

* وبذلك ال animea - sign وليست Disease

تعريف : Animea
Low Hgb
Low RBC
Low O_2

الفرق بين Hemoglobin (Hgb) وال Hematocrit (HCt) ؟

Hemoglobin (Hgb) ↓ البروتين المسؤول عن نقل O_2 في ال RBC

Hematocrit (HCt) ↓ mass of RBC from the total blood mass

* $Hgb = \frac{HCt}{3}$ ال بالعادة $12 = \frac{36}{3}$

Anemia
male 13-17
General Principles:
female 13-15

✓ Anemia is defined as a decrease in circulating RBC mass; the usual criteria in adults being Hgb < 12 g/ dL or Hct < 36% for nonpregnant women and Hgb < 13 g/ dL or Hct < 39% in men.

✓ Classification Anemia can be broadly classified into three etiologic groups:

• blood loss (acute or chronic)
لو كمية/ حادة/ مزمنة
→ UGI bleeding (long term)

• decreased RBC production
→ bone marrow problem → (Iron, folic acid, B12) nutrients احد اهم اسبابها نقص

• increased RBC destruction (hemolysis).
Drug induce, لو تكسر سيبها هنا

✓ Anemia can also be categorized by RBC size as microcytic, normocytic, or macrocytic.

① microcytic: لو حجمها صغير تحت الـ microscope < 80
② normocytic: 80-96
③ macrocytic: > 96

* الـ test اللي يبين حجم الـ RBC = MCV
Mean Corpuscular Volume or mean cell volume [illegible]
80-96 fL (femto liter) Normal

Diagnosis :

Anemia is always caused by an underlying disorder; thus, a careful evaluation to determine the etiology is required in each case.

❖ Clinical Presentation :

✓ Acute anemia: Patients with abrupt onset of anemia tolerate diminished RBC mass poorly.

Patients may have symptoms of fatigue, malaise, dyspnea, syncope/ presyncope, or angina.

✓ Chronic anemia: In contrast to acute anemia, patients with chronic anemia are less symptomatic, at times only presenting with fatigue or dyspnea with increased activity or exertion.

However, patients usually have symptoms when Hgb < 7 g/ dL.

WHO Classification → Mild → female 10 - 11
male 10 - 12
Moderat 8 - 10 Male/Female
sever < 8

❖ Physical Examination

✓ Common signs and symptoms of anemia include pallor, tachycardia, hypotension, dizziness, tinnitus, headaches, decreased cognitive ability, fatigue, and weakness.

لما حكي شاحب غير عن أصفر الشحوب = صافي لون قريب من الابيض

Mild/ Moderat severe تتدرج الاعراض حسب

✓ Patients may also experience reduced exercise tolerance, dyspnea on exertion, and heart failure. → high الي بكون اسمه classifications ال HF ك defenetion شو هو Low cardic outpouts

✓ High-output heart failure and hypovolemic shock may be seen in acute, severe cases.

1 2

emergancy setiuation

Diagnostic Testing

✓ Laboratories:

• CBC → WBC, MCH, RBC, Hgb, Hct, HCV reticulocyte count, and inspection of the peripheral smear will guide further laboratory testing because they provide a morphologic classification and assessment of RBC production.

Immature RBC — under microscop (blood film) — morphologic → unde microscope — production → retecleosite / bone marrow

• The most useful red cell indices are:

RBC parameter — MCV, MCH, MCHC, RDW

- Mean cellular volume (MCV): Measures the mean volume of the RBCs (80-96 fL) — Average
- Red cell distribution width (RDW): Reflects the variability in the volume of the RBCs — Macrostatic

RBC صغيرة ← نقص الحديد — more than one cause — RBC كبيرة ← نقص B12

• The relative reticulocyte count measures the percentage of immature red cells in the blood and reflects production of RBCs in the bone marrow. — Low — Iron defecncy animea

✓ Diagnostic Procedures

• A BM biopsy is often indicated in cases of unexplained anemia with a low reticulocyte count or with anemia associated with other cytopenias → Low → Bone Marrow

? BM biopsy

Anemias Associated With Decreased Red Blood Cell Production

Iron Deficiency Anemia (IDA)

General Principles

- ✓ Iron deficiency is the most common cause of anemia in the ambulatory setting and is usually a chronic microcytic anemia with a low reticulocyte count.

- ✓ The most common causes of IDA are blood loss (e.g., menses, GI blood loss), decreased absorption (e.g., achlorhydria, celiac disease, bariatric surgery, H. pylori infection), and increased iron requirement (e.g., pregnancy).

Anemias Associated With Decreased Red Blood Cell Production

Type 1

Iron Deficiency Anemia (IDA)

↓ Iron ↓ Hb ↓ RBC ↓ O_2 capacity

↓ Iron → ↓ RBC production

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(1) (2) (3)

نقص HCL يقلل امتصاص الـ Iron

نقص بالحموضة [ppi او antiacid]

في الـ IDA: الحديد طبيعي (في مخزون)

4 Iron parameter:

1. serum Iron
2. Total iron binding capacity (TIBC)
3. Ferritin ↓
4. Transferrin saturation (TSAT)

اذا في Iron defecncy animea بكون قليل لانه الناقل غير مشبع تكون النسبة قليلة اقل من 20٪

في الـ Iron defecncy animea بكون عالي قدرت البروتين انه يربط حديد عالية لانه اصلا" ما في حديد في اماكن فاضية الو يعني

Diagnosis

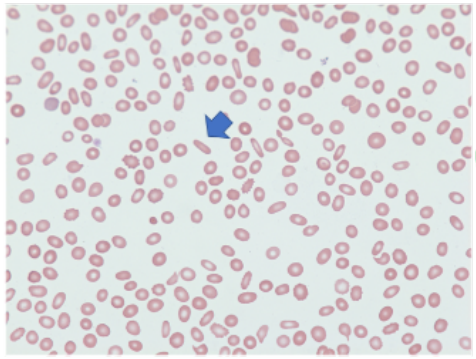
✓ Clinical Presentation

- Patients often present with cold intolerance along with fatigue or malaise that is typically worsened with activity.
- Pica (consumption of substances of no nutritional value as starch, or clay) occurs in about 25% of patients with chronic IDA and rarely occurs in other clinical settings.
- Pallor is a common physical finding in patients with IDA but is not specific.

✓ Diagnostic Testing

- Peripheral blood smear may show hypochromia (increased central pallor of RBCs), microcytosis, and pencil-shaped cells.

لون فاتح تحت
الحاليكوسكون



حجم صغير
Pencil-shap cell
نحاف وطوال

- The reticulocyte count is inappropriately low in IDA.

✓ Laboratories

بروتين مسؤول عن تخزين ال iron

- Ferritin is the primary storage form for iron in the liver and is a specific marker of an absolute iron deficiency. The reference range is 30– 400 ng/ mL.

- A ferritin level of < 10 ng/ mL in women or < 20 ng/ mL in men almost always reflects low iron stores.

يرتفع بال inflammatory condition.

- Ferritin is an acute-phase reactant, so normal levels may be seen in inflammatory states despite low iron stores.

False result يعطيني في infection عندما المريض يعني اذا

Treatment

1

✓ Oral iron therapy

- Given in stable patients with mild symptoms. or moderate
- Several different preparations are available (Table).
- Iron is best absorbed on an empty stomach.
- Oral iron ingestion may induce a number of GI side effects, including epigastric distress, bloating, and constipation. As a result, nonadherence is a common problem.
- These side effects can be decreased by initially administering the drug with meals or every other day and increasing the dosage as indicated/ tolerated.

يعطى قبل ساعة قبل الأكل لكن يعطى للمريض مع الأكل عشان يقل الـ GI adverse و يزيد الـ adherance ولانه العشرة طويلة 3-6 month او اكثر لازم اهتم لـ adherance

1 2 3 5 Dark Stool

فترة أطول

step up شوي شوي

Vc + Iron ⇒ ↑ GI risck of bleeding

- Ferrous sulfate is the most commonly prescribed formulation.

الحديد بحد ذاته هذا الشديد

- If there are unacceptable side effects, consider using a lower dose or an alternative formulation such as ferrous gluconate or ferrous fumarate, which contain lower amounts of elemental iron and may be better tolerated.

element أقل ← strength الا اذا الـ أعلى

- In general, patients responding to oral iron therapy should see an increase in reticulocyte count within 1 week of therapy; an increase in Hgb of 2 g/ dL every 3 weeks is expected.

بالعادة بعد شهر نجيب الدوا

- Treatment should be continued until the total iron deficit is replete.

* Recomended Dose of Iron in (IDA) ?

100 or 150 – 200 mg elemental Iron/24h

حسب المرجع reference

For tretment

* Total elemant Iron → salt

strength يدنا نشبث ال
300 mg

Iron Salt	Percent Elemental Iron	Common Formulations and Elemental Iron Provided
Ferrous sulfate	20 % = 60	60-65 mg/324-325 mg tablet 60 mg/5 mL syrup 44 mg/ 5 mL elixir 15 mg/1 mL drops
Ferrous sulfate (exsiccated)	30 %	65 mg/200 mg tablet 50 mg/160 mg tablet
Ferrous gluconate	12 % = 36	38 mg/325 mg tablet 28-29 mg/240-246 mg tablet
Ferrous fumarate	33 % = 99	66 mg/200 mg tablet 106 mg/324-325 mg tablet

Table: TABLE 118-1 Oral Iron Products

side effect

Drugs That Decrease Iron Absorption	Drugs Affected by Iron
Al-, Mg-, and Ca^{2+}-containing antacids	Levodopa ↓ (chelates with iron)
Tetracycline and doxycycline	Methyldopa ↓ (decreases efficacy of methyldopa)
Histamine$_2$ antagonists	Levothyroxine ↓ (decreased efficacy of levothyroxine)
Proton-pump inhibitors	Penicillamine ↓ (chelates with iron)
Cholestyramine	Fluoroquinolones ↓ (forms ferric ion quinolone complex)
	Tetracycline and doxycycline ↓ (when administered within 2 hours of iron salt)
	Mycophenolate ↓ (decreases absorption)

Table: TABLE 118-2 Iron Salt–Drug Interactions

300 mg → 20/100 = 60

sulfate 3

fumerate