Iron deficiency anemia

① 38y pregnant woman - H/o multiple, closely spaced pregnancy. develops- fatigue, pallor, koilonychia, alopecia, atrophic changes of tongue.

- diagnosis?
- PSF, BMF
- other lab investigation to confirm diagnosis
- pathogenesis, eliopatho.
- complication.

CBC - Hb, Hematocrit MCV, MCHC, MCH. RDW.

- Serum iron studies
- reticulocyte count
- in bleeding ds occult blood test in stool.

Chronic blood loss

from GIT.	urinary tract.	Genital tract
• peptic ulcer • Gra Ca • Colon Ca • hookworm • hemorrhoids	• renal Ca. • bladder Ca • PN hemoglobinuria.	menorrhagia uterine Ca.

Etiology

① dietary lack

② Impaired absorption

③ Increased requirement

④ chronic blood loss.

dietary lack

- milk fed infants.
- Elderly with improper diet & poor dentition
- low socio-economic sections
- vegetarians [contain poorly absorbable inorganic iron].

Impaired absorption

- Celiac disease.
  sprue.
- gastrectomy.
- certain drugs, oxalates, phytates of cereals can impair iron absorption.

Increased requirement

- children, adolescents.
- pregnancy, lactation.
- closely spaced pregnancy.
- women in reproductive age group.

Pathogenesis

- It occurs due to decreased heme synthesis.

3 stages.

stage I : Iron depletion.

- there is negative iron balance but serum iron levels are Normal.
- normal Hb level.
- and only serum ferritin is decreased

stage II : Iron deficient erythropoiesis.

- Iron supply to Bone marrow is deficient & erythropoiesis begins to suffer in Bone marrow.
- serum iron level & transferrin saturation levels are lowered.
- no anemia yet.
- Bone marrow show iron deficient erythropoiesis.

stage III : Iron deficiency anemia.

- low serum iron
- low serum ferritin & transferrin saturation.
- Impaired hemoglobin production.
- anemia occured when Fe stores depleted fully → ↓ serum ferritin.
- microcytic hypochromic RBC.

LAB DIAGNOSIS

Peripheral Blood.

- Hemoglobin & hematocrit (PCV) decreased
- ~~indices~~
- Red cell indices :
  - MCV < 80 — ↓ decreased.
  - MCH < 25 — ↓
  - MCHC < 27 ↓.
- Red cell distribution width RDW — increased.
  ↓
  earliest sign of iron deficiency.

Peripheral blood Smear

RBC : microcytic hypochromic anemia.

- anisopoikilocytosis.
- (pencil cells) cells / cigar cells.

WBC : Normal.

platelets : Normal.

- Reticulocyte count ↓. : early feature of IDA

Bone Marrow

- Cellularity : Moderately hypocellular.

~~M:E ratio :~~

Erythropoiesis : hyperplasia.
micronormoblastic maturation.

myelopoiesis : N

megakaryopoiesis : N.

★ absence of Bone marrow iron. ★

Gold standard test.

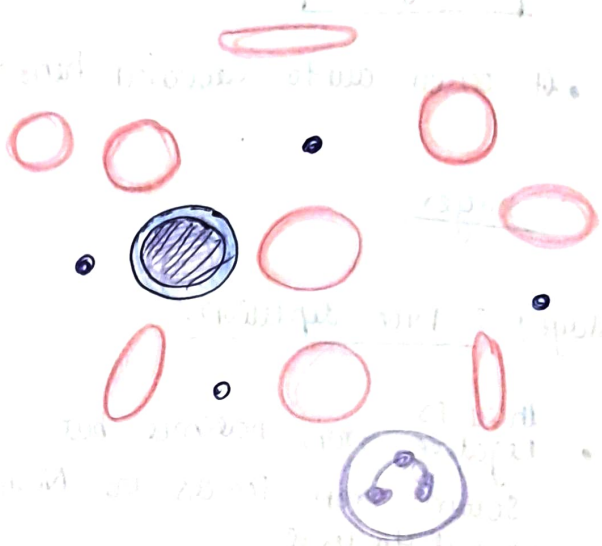
demonstrated by negative prussian blue reaction.

Serum Iron profile

- serum ferritin
- Serum iron
- Serum transferrin saturation ↓

- Total plasma iron binding capacity. ↑
- Serum transferrin receptor
- red cell protoporphyrin

PBS



- microcytic hypochromic RBC
- pencil cells
- anisopoikilocytosis.

CF

- PICA, Koilonychia, angular stomatitis, glossitis.

Plummer Vinson syn / Paterson kelly syn.

- Iron def anemia
- atrophic glossitis
- esophageal webs.

Complications

Stage I

- depletion of storage Fe (↓ serum ferritin).
- Normal – transferrin saturation, TIBC (↓ transport iron)
- Normal Hb.

Stage-2

- low transport Fe. non dy erythropoiesis
- depletion of storage Fe
- low transport Fe
- (N) Hb.

Stage 3

- low Hb – IDA.
- ↓ Fe store.
- low transport iron.
- low Hb.
- mcv ↓, mch ↓.

Complications.

- CVS – tachycardia, palpitation, high output heart failure.
- Neurological – fatigue, dizziness, poor conc.
- epithelial – Glossitis, angular cheilitis, stomatitis, koilonychia (spoon nails).
- PICA. – craving for non food items like clay.
- pregnancy – low birth weight. preterm delivery
- Sx – plummer vinson Sx.