

Iron Deficiency Anemia.

- Microcytic, Hypochromic anemia.
- Most common nutritional deficiency disorder.

Sources of Iron

- Iron from Dead RBC is recycled.
- Through ingestion
 - Normally 10-20mg of iron in diet
 - Only 10% absorbed (1-2mg) (Increased in pregnancy)

Forms of Iron

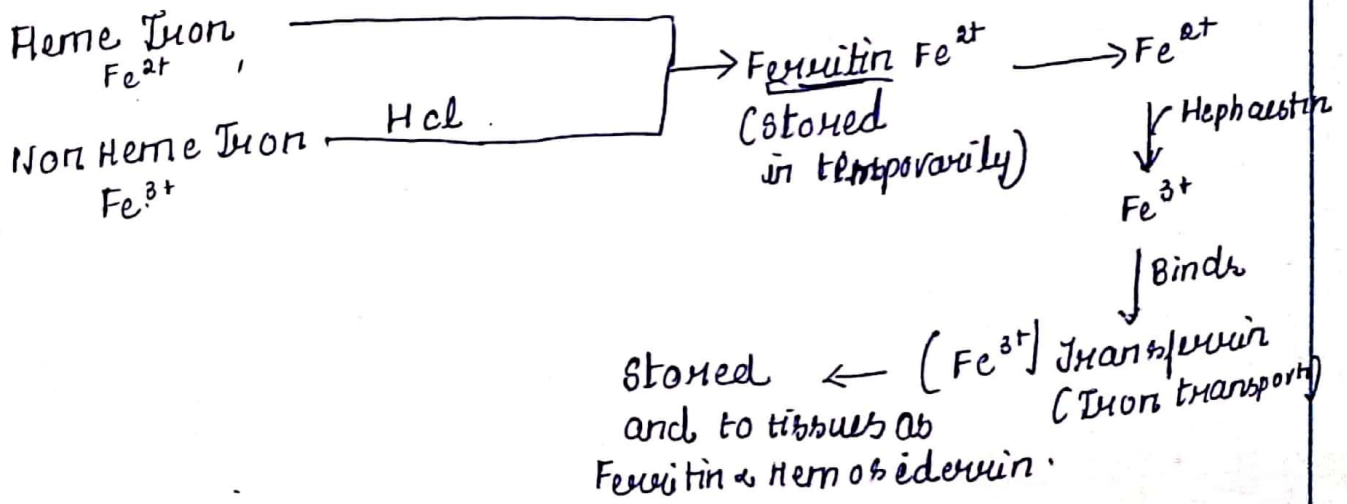
Heme Iron (Fe^{2+})

- Binds to Hb, Myoglobin
- In Animal products

Non-Heme Iron (Fe^{3+})

- Free iron molecules
- Plant based foods.

Absorption & Transport



Excretion:

- 1mg of iron through sweat, feces, and twice in the menstruating women.

Causes of Iron Deficiency anemia

i) Decreased intake:

- * Most common cause worldwide
- * Infants $\rightarrow$ $\downarrow\downarrow\downarrow$ Iron in Breast milk
- * Vegetarians $\rightarrow$ Non-Heme Iron difficult to absorb

ii) Decreased absorption

- * Decreased stomach acid
 - after gastrectomy
 - Tannic acid in tea.
 - Milk, EDTA,
- * Inflammatory bowel disease or Celiac disease.
 - destruction and inflammation of duodenal cells

iii) Increased Demand

- * Children & Adolescents
 - Rapid growth, $\uparrow$ Blood volume
- * Pregnancy.
 - $\uparrow$ Iron requirement for fetal development

iv) Increased loss

- * Females in Reproductive life - Heavy menstruation
- * Post menopause $\rightarrow$ CA uterus
- * Adults $\rightarrow$
 - GIT $\rightarrow$ Peptic ulcer, Hemorrhoids, Colon Cancer, Ulcerative Colitis, Oesophageal varices, Hookworm infestation.
 - Urinary $\rightarrow$ Hemoglobinuria, Hematuria
 - Nose $\rightarrow$ Epistaxis repeatedly
 - Lungs $\rightarrow$ Haemoptysis

Pathogenesis:

low Iron $\rightarrow$ low Hb

↓ Bone Marrow

Microcytic RBC

Нуротимотис

↓

↓
No enough O_2 to finish.

↓ Емфтиморезитін

Bone marrow pumps
incomplete RBCs

Poikilocytoris (shapes) Anisocytoris (sizes)

(shapes)

- Defective Production of Mitochondrial Enzymes

↓ ATP → affects fast growing tissues (skin, nails)

Symptoms

Typical signs of
Amenia

- i) Pallor
- ii) Palpitations
- iii) Fatigue
- iv) Shortness of breath.

Specific Iron Deficiency
Deficiency Appetite.

- i) Koilonychia
- Spoon shaped nails.
- ii) Nail Patches.
- iii) Risa, Onychomycosis, Phagophagia

↓

Soil.

↓

Ice

Plummer Vinson Syndrome

- Giardiasis
- Esophageal webs (Dysphagia)
- Iron deficiency anemia (koilonychia)

Investigation & Diagnostic Parameters in blood

Decreased

- Hb ↓
- MCV ↓
- MCHC ↓
- MCH ↓
- Serum Iron ↓
- Ferritin ↓

* Peripheral Blood Smear
→ Microcytic & Hypochromic RBCs

Treatment:

* Address the Cause

* Oral Iron Supplements

✓ ↓ Ferrous sulphate + Orange Juice (Absorbed easily)
(Acidic)

✓ When side effects are not tolerated → Intravenous Iron.

- In severe cases → Blood Transfusion.

Increased

- ↑ TIBC (↑ ^{unbound} Iron/iron)
- Red blood Distribution Width (RDW)
(Different RBC size)