



- Causes of iron-deficiency anemia:

- Chronic blood loss (from GIT, heavy menstruation, hookworms...etc).
- Increased demand (growth, pregnancy, lactation...etc).
- Malabsorption (alcohol, drugs, post-gastrectomy).
- Dietary deficiency (more common in developing countries).

- Iron therapy can be:

• Oral:

- ✓ **Iron alone:** they can be in the form of drops & suspensions or tablets & capsules or modified-release formations. Examples include: ferrous sulphate (tablet size is 200mg and it contains 65mg of iron) & ferrous gluconate (contains less iron). These are cost-effective.
- ✓ **Iron + folic acid (500mg):** they can be in the form of tablets & capsules or modified release formations. These are not absorbed well as iron alone and they cost more.
- ✓ **Iron + minerals (Zn,Co,Cu,Cr) + vitamins (vitamin C & B-complex):** they can be in the form of tablets & capsules or modified-release formations.
  - \* *Note:* vitamin C aids in the conversion of iron from the ferric to the ferrous form so it can be absorbed easily.
  - \* *Adverse effects:* these are related to GIT and include (nausea, abdominal discomfort, diarrhea & constipation which is more common to occur than diarrhea). These adverse effects are less common with ferrous gluconate & ferrous fumarate.
  - \* *Treatment:* initial treatment is with the lowest dose (200mg tablets of ferrous sulphate which contain 65mg of iron). Response to iron therapy in anemia is 1g/dl/wk increase in Hb level (the earliest response is detected by doing reticulocyte count). The treatment must be continued for 3 months after correction of Hb (to replenish the stores).
  - \* *Calculation of iron deficit:* Hb deficit (g/dl) x body wt (kg) x 0.65 x 3.4
  - \* *Failure to respond to oral iron therapy:* because of unsuitable formula – pharmacokinetics (reduced with antacids) – cost – compliance – improper diagnosis.

• Parenteral:

- ✓ **Indicated in:** excessive adverse effects with oral iron therapy – malabsorption – poor compliance – continued blood loss (because the underlying cause cannot be corrected).
- ✓ **Preparations:** iron dextran – iron sorbitol – iron sodium gluconate – ferumoxytol (commonly used nowadays).
- ✓ **Adverse effects:** pain and discoloration with IM injection – hypersensitivity with IV injection.

- Iron toxicity:

• Acute:

- ✓ Mostly in young children.
- ✓ Activated charcoal is ineffective antidote.
- ✓ **Deferoxamine (IV/SC) is an iron chelating agent which is an effective antidote.**

• Chronic:

- ✓ Known as hemochromatosis.
- ✓ **Treated by:** phlebotomy ± deferoxamine.

- Anemia of chronic disease (chronic inflammation or malignancy):

- It is normocytic normochromic but it can be microcytic hypochromic in some patients.
- **Treated with:** recombinant erythropoietin or darbepoietin.

- Megaloblastic anemia:

- **B12 deficiency (due to veganism or malabsorption):** will be treated by hydroxocobalamine or cyanocobalamine.
- **Folate deficiency (poor diet or malabsorption or ↑demand):** will be treated by folate (PO).

- G6PD deficiency (hemolysis of RBCs due to oxidative stress): severe <10% , mild-moderate 10-60%.