

# PHYSIOLOGY OF IRON DEFICIENCY ANAEMIA IN PREGNANCY

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# CONCEPT OF PHYSIOLOGICAL ANAEMIA

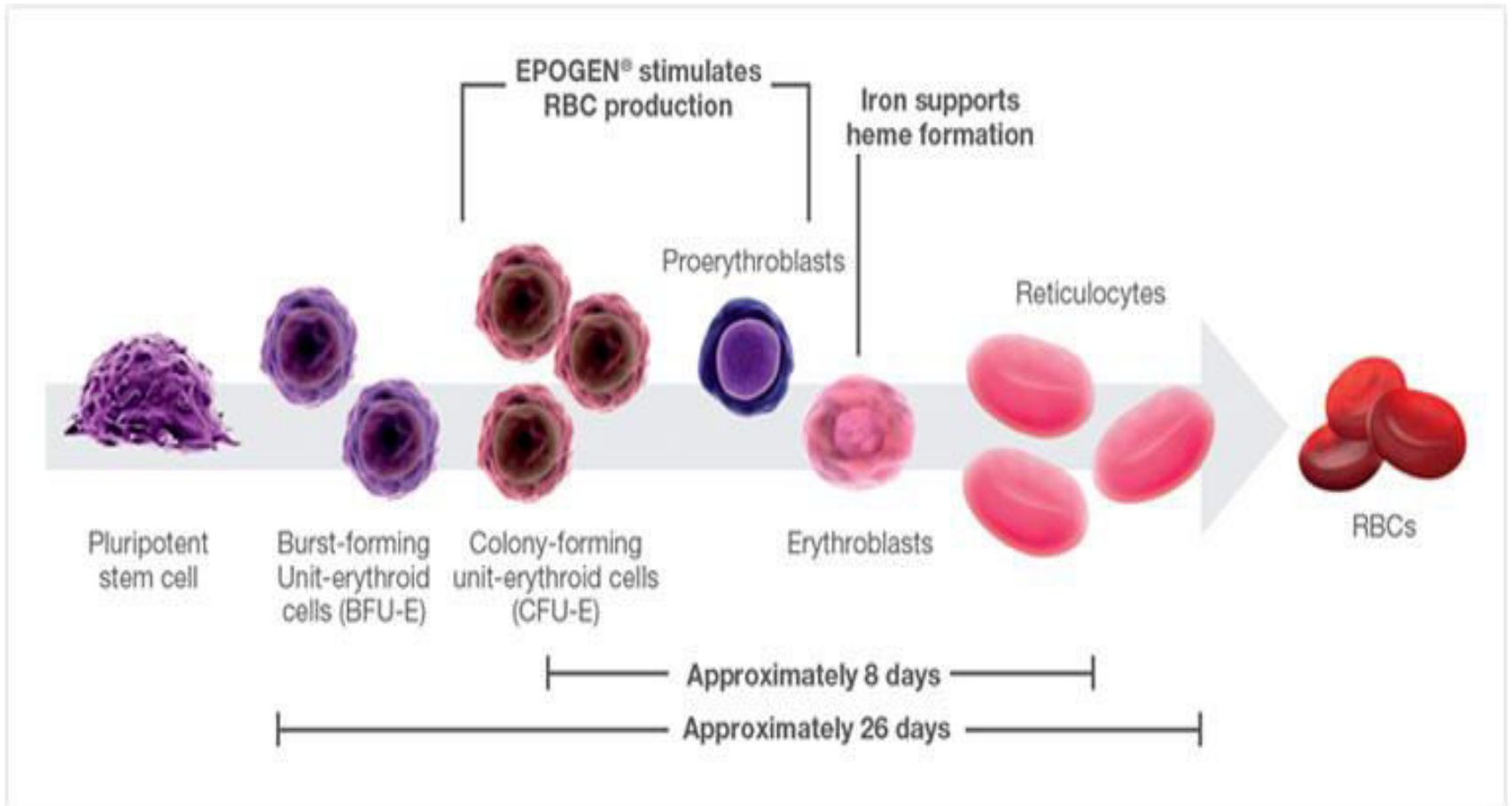
- The main causes of physiological anaemia during pregnancy are:
  1. Disproportionate increase in the plasma volume, RBC volume and Hb mass.
  2. Increased demand for iron.
- The anaemia is **normocytic, normochromic** type.

	<b>NON- PREGNANT WOMAN</b>	<b>SECOND HALF OF PREGNANCY</b>
Haemoglobin (Hb)	14.8 g/dL	11-14 g/dL
Red blood cells (RBC) count	5 million/ cu.mm	4-4.5 million/ cu.mm
Packed cell volume (PCV)	39-42 %	32-36 %
Serum Iron	60-120 $\mu\text{g/dL}$	65-75 $\mu\text{g/dL}$
Total Iron Binding Capacity (TIBC)	300-350 $\mu\text{g/dL}$	350-400 $\mu\text{g/dL}$
Serum ferritin	20-30 mg/L	15mg/L

# Criteria of physiological anaemia

The lower limit of physiological anaemia during the second half of pregnancy should fulfill the following haematological values :

- Hb - 10 g%
- RBC count - 3.2 million/ cu.mm
- PCV - 32%
- Peripheral smear - normal RBC with central pallor.



# ERYTHROPOIESIS

# Requirements for normal erythropoeisis.

- **Minerals** :
  - i. Iron
  - ii. Cobalt and copper
- **Vitamins** : Vit B12, Folic acid and Vit C.
- **Proteins** .
- **Erythropoeitin** .

# CAUSES OF INCREASED PREVALENCE OF ANAEMIA IN TROPICS

- Iron deficiency anaemia is most prevalent in tropics amongst women of child bearing age, especially in the under privileged sector.
- There is increase in the daily requirement of iron.



Causes for increased daily requirement are :

• Before pregnancy :

1. **Faulty dietary habits** - intake of diet rich in carbohydrate. ( Phosphates and phytates)

2. **Faulty absorption** - prevalence of intestinal infections, hypochlorohydria etc.

3. **Increased iron loss** -

a. Increased loss in sweat.

b. Repeated pregnancies in short intervals.

c. Excessive blood loss during menstruation.

d. Hook worm infestation.

e. Chronic malaria.

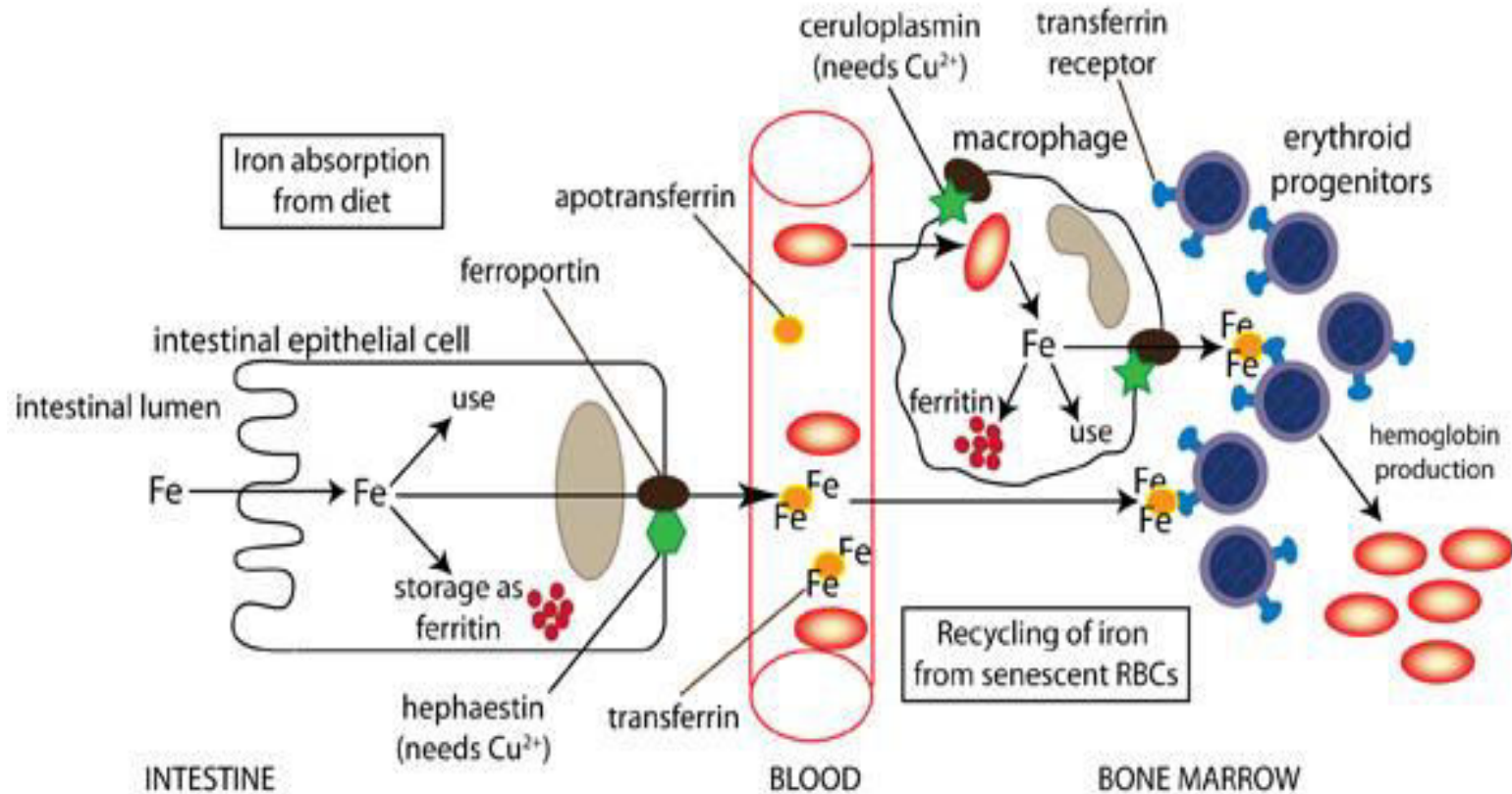
f. Bleeding piles or dysentery.



- During pregnancy :

1. Increased demands of iron.
2. Diminished intake of iron - low socio-economic group, faulty diet, loss of appetite, vomitings.
3. Diminished absorption - antacids, hypochlorohydria.
4. Disturbed metabolism - presence of infection.
5. Pre-pregnant health status - pre-existing anaemic state.
6. Excess demand -
  - a. Multiple pregnancies.
  - b. Rapidly recurring pregnancy.
  - c. Young age of pregnant lady.

# IRON DEFICIENCY ANAEMIA



NORMAL IRON METABOLISM

# Pathophysiology

- ✓ **Stage 1** is characterized by decreased bone marrow iron stores; Hb and serum iron remain normal, but serum ferritin level falls. There is compensatory increase in iron absorption and increase in TIBC (transferrin level).
- ✓ **Stage 2**, Erythropoiesis is impaired. Although TIBC increases, the serum iron level decreases; transferrin saturation decreases.
- ✓ **Stage 3**, anemia with normal-appearing RBCs and indices develops.
- ✓ **Stage 4**, microcytosis and then hypochromia develop.
- ✓ **Stage 5**, iron deficiency affects tissues, resulting in symptoms and signs.

# Clinical features

- Symptoms :

1. Lassitude and feeling of weakness.
2. Easy fatigability, dyspnoea on exertion.
3. Anorexia , indigestion, palpitations.

- Signs :

1. Pallor of varying degrees, koilonychia, atrophic glossitis, angular stomatitis.
2. Edema of leg if associated pre-eclampsia present.
3. Soft systolic murmur due to physiological mitral incompetence.



**PALLOR IN PALMS**



**CONJUNCTIVAL PALLOR**



**KOILONYCHIA**



**ANGULAR STOMATITIS**



**ATROPHIC GLOSSITIS**

THANK YOU