

HAEMATINICS



PRESENTED BY:-
ASHUTOSH RAO
BSC NURSING 3rd SEMESTER
CIMS&R College, DEHRADUN

GUIDED BY:-
MS HEMA
NURSING TUTOR



INTRODUCTION



- Haematinics are the substances required in the **formation of blood** & are used for treatment of **anaemias**.
- They help in improving the quality of blood.
- Haematinics stimulate the **production of Red Blood Cells (RBC)** or increase the amount of **Haemoglobin in the blood**.

Anaemia

* Anaemia is a medical conditioning in which **body does not have enough Red Blood cells (RBC)**.

*In Anaemia the **concentration of hemoglobin in blood is reduced** which results in reduced oxygen flow to the body's organs.

CAUSES:-

* Anaemia occurs when **balance between production and destruction of RBCs are disturbed by:**

- i) **Blood loss** in acute (hemolysis or hemorrhage) and chronic conditions (stomach ulcer, cancer).
- ii) **Increased destruction of RBCs** (Hemolytic Anaemia)



iii) **Impaired RBCs formation** due to :---

(a) Deficiency of Iron, Vitamin B12, Folic acid.

(b) **Bone marrow depression i.e.** Decrease number of **Hematopoietic cells** in bone marrow. It is caused by disease of bone marrow, reduce production of **erythropoietin** (Hormone produced by kidney that stimulate RBC production), anticancer drugs (along with cancer cells they stop replication of healthy cells).



TYPES OF ANAEMIA

Microcytic

Deficiency of iron

1

6

Sickle Cell

Sickle shape RBCs

Macrocytic

Deficiency of Folic acid and B2

2

5

Haemolytic

Excessive Haemolysis

Pernicious

Lack of Intrinsic Factor INF

3

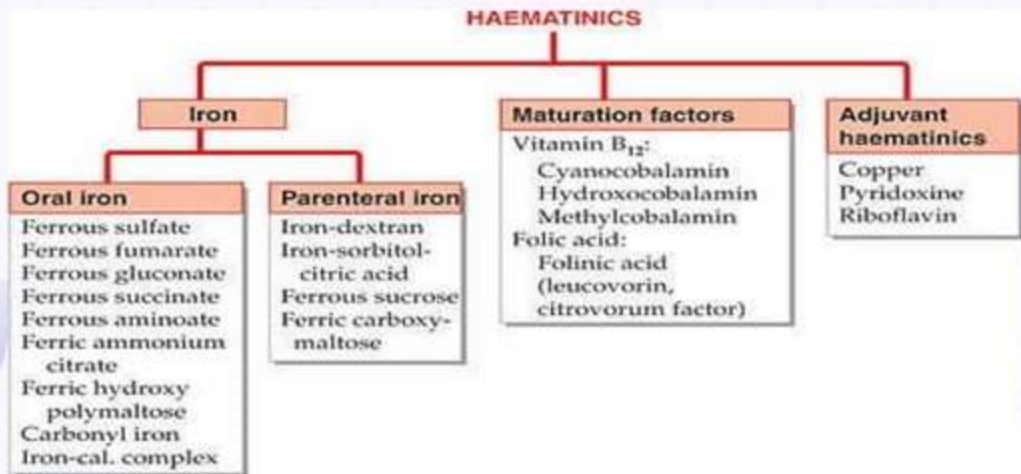
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Aplastic

Bone marrow dysfunction



Classification of haematinics drugs



1) IRON



- All body cells need Iron for their normal functioning.
- Iron is crucial for oxygen transport, energy production, cellular growth and proliferation.
- The human body contain an average **3.5gm of Iron**.
- Typical daily diet contain **10-20mg** of Iron. **5-10% is only absorbed**.

Distribution of Iron in human body

Haemoglobin

66%

**Iron stored as Ferritin
and haemosiderin**

25%

**Parenchymal Iron (In
enzymes)**

6%

Myoglobin in muscles

3%

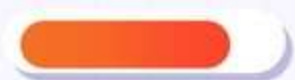
Daily Requirements of iron

Adult Male



8mg

Adult Female



18mg

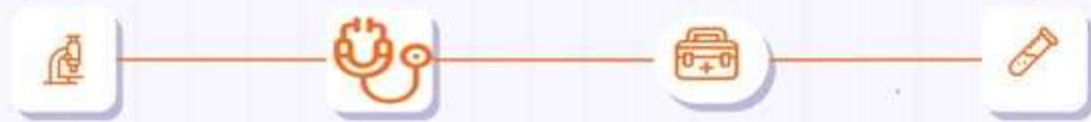
Pregnant



27mg

Absorption of Iron

site of absorption :- **Duodenum and upper Jejunum**



- Dietary Iron in **Ferric(Fe³⁺)** is low soluble in neutral pH and do not absorb

**ASCORBIC →
ACID**

- Reduced to **Ferrous(Fe²⁺) + vitamin C**



- Soluble **Iron-ascorbate chelate**



- Absorption occur

STORAGE AND EXCRETION

Storage

In two forms:- **Ferritin** and **Haemosiderin**

Excretion

- GI mucosa cells
- bile, sweat and urine



Preparation & Dose

ORAL IRON:-

- 1) Ferrous Sulphate ----Fersolate 200mg tab.
- 2) Ferrous Gluconate---Ferronicum 300mg.
- 3) Ferrous Fumerate--- NORI-A 200mg tab.
- 4) Colloidal Ferric Hydroxide---Neoferum 200mg

PARENTERAL IRON:-

- 1) IV and IM
- 2) IRON Dextran— 2ml ampoule
- 3) IRON Sorbitol Citric Acid Complex— 1.5 ml ampoule

DIETARY SOURCE

Liver, Egg yolk, Dry fruits, Spinach, Root vegetables

Adverse effect

- 1) Epigastric Pain (Pain in upper abdomen)
- 2) Heart burns
- 3) Nausea, Vomiting
- 4) Metallic Taste
- 5) Constipation

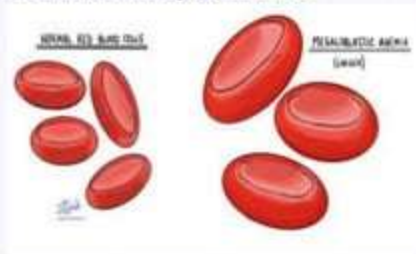


Maturation Factors

- * Vitamin **B12** and **Folic acid** are called **maturation Factors**.
- * Deficiency of these results In **Megaloblastic Anaemia** characteristics by presence of large red cell precursors in bone marrow.

2) Vitamin B12:-

- * **Cyanocobalamin** and **Hydroxocobalamin** are the complex cobalt containing compound present in diet & referred as Vitamin B12.
- * Vitamin B12 help in Development, proper functioning of CNS, healthy RBCs formation and DNA synthesis.



Utilization & Deficiency of vitamin B12

- Vitamin B12 is a **water soluble** , **thermostable red crystal**
- Vitamin B12 is taken up especially by **Liver cells** and stored about **2/3** in body.
- Vitamin B12 is **not degraded** by the body. It is excreted mainly in **bile**.
- Deficiency:--
 - 1) **Pernicious anaemia** is an autoimmune disease which results in destruction of **parietal cells** → absence of intrinsic factor in gastric juice → inability to absorb vitamin B12.
 - 2) **Gastric** and **intestinal mucosa** Damage.



DIETARY SOURCE

Liver, kidney, egg yolk, cheese, vegetables and legumes.

Daily Requirement

- 1) Adult Male and Female:- 2.4 mcg
- 2) Pregnant women:- 1-3 mcg
- 3) Lactating women:- 3-5

Preparation and dose :-

Cyanocobalamin:- 35 mcg/ 5ml liq.
Hydroxocobalamin:- 500 mcg and 1000 mcg inj.



3) FOLIC ACID :--

A **Yellow**, crystalline **water soluble vitamin** essential for cell growth and reproduction. It function as a **Coenzyme** with Vitamin B12 in metabolism and use of proteins and in the **formation of Nucleic acid** and hence for Haemoglobin.

ADVERSE EFFECTS :-

Oral Folic acid is entirely **non toxic**. Injections rarely cause sensitivity reactions.



Utilization :--

- (a) Folic acid is present in food as **Polyglutamate**, the additional glutamate residues are split off primarily in the **upper intestine before being absorbed**.
- (b) It is transported in blood mostly as **methyl THFA** which is partially bound to plasma protein.
- (c) Folic acid **stored in cell as Polyglutamates**. **Liver** takes up a large part & secretes Methyl THFA in bile which is mostly reabsorbed from Intestine.

Dietary sources :-

Folate is found mainly in **dark green leafy vegetables**, beans, peas, and nuts.

Fruits rich in folate includes orange, lemon, bananas, melons and strawberries.

Daily Requirement :-

In **adults is <0.1mg** but dietary allowance of **0.2mg/day** is recommended.

During **pregnancy, lactation 0.8mg/day** is considered appropriate.

Preparation and dosage :-

FOLIC ACID :

Folvite 5mg tab. (therapeutic 2 to 5 mg/day, Prophylactic 0.5 mg/day)

FOLINIC ACID :

Calcium leucovorin, 3mg/ml inj. & Fastovorin 50mg vial

USES OF FOLIC ACID SUPPLEMENTS:-

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- (1) Megaloblastic Anaemia
- (2) Prophylaxis
- (3) Methotrexate Toxicity
- (4) Citrovorum factor rescue
- (5) To enhance anticancer efficacy of (5-FU)

ROLE OF NURSE

- Nurse should assess for contraindications and any known allergy to the drug being administered to **avoid hypersensitivity reactions**.
- Nurse should **ensure Iron deficiency Anemia** before the administration of drug to ensure proper use of drug.
- Nurse should educate the patient to take **Iron** with **Citrus Fruits** to enhance its absorption.
- **IV infusion of Iron** should be given **slowly** to prevent hypersensitivity.
- Nurse should educate the patient regarding good dietary habits and balance diet.



THANK YOU