

ANEMIA

Prepared by:

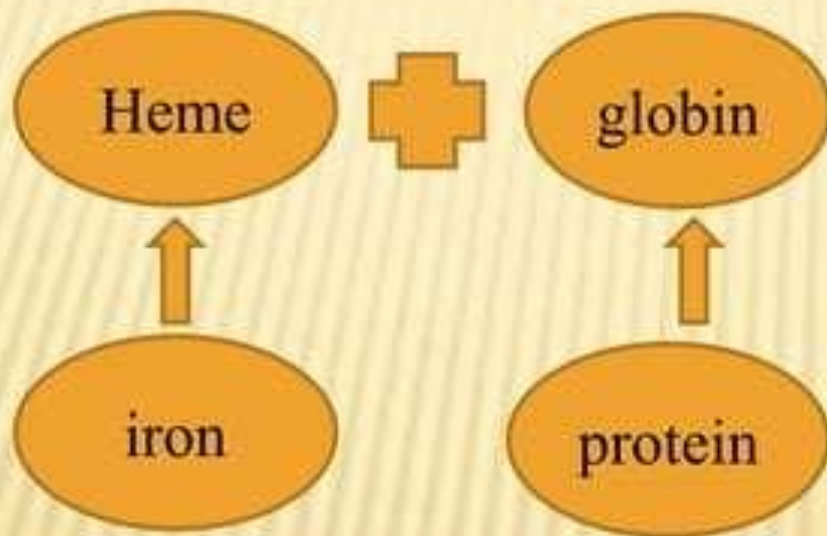
Binita Bhattarai

Bsc.Nursing 4th yr

6th batch

INTRODUCTION

- ❑ Hemoglobin: Iron containing protein in the blood which transport oxygen to the tissue.



- ❑ It is responsible for the shape of RBC(donuts shape) and also for the red colour of blood.

NORMAL LEVEL

- Male: 13.5-17.5gm/dl
- Female: 12.5-15.5gm/dl

IN CHILDREN

ANEMIA

- Anemia is the most common type of blood disorder among infants and children.
- It refers to the lack of hemoglobin in blood.

DEFINITION

- ❑ Anemia is the condition in which the hemoglobin concentration becomes lower than body requirement; which reflects the presence of fewer no of RBC within the circulation; as a result the amount of oxygen delivered to body tissues is also diminished.

GRADING OF ANEMIA

□ According to WHO:

- ✓ Hb level between 10gm/dl-11 gm/dl:mild
- ✓ Hb level between 5gm/dl-10 gm/dl:moderate
- ✓ Hb level below 5gm/dl-severe

CLASSIFICATION

Classification of Anemia according to etiology

Decreased RBC production

Bone Marrow Failure:
Primary: red cell aplasia
Secondary: chronic illness, infection, malignancy

Nutritional deficiency:
iron, folate, B12, blood loss

Increased RBC loss

Acute or chronic blood loss:
epistaxis, hemophilia, hookworm, piles, dysentery

Increased RBC destruction

Extracorpuscular:
Toxic substance, Malaria, kalazar

Intracorpuscular
Thalassemia,

PATHOPHYSIOLOGY

Decreased O₂ carrying capacity of blood



Hypoxia



Severe reduction of RBC causes hemodilution and
Decreased peripheral resistance



Cardiac workload increased



Cardiac failure

A microscopic view of numerous red blood cells (erythrocytes) in a blood vessel. The cells are biconcave discs, appearing as bright red, slightly flattened spheres with a darker center. They are densely packed in the center of the vessel and more sparsely distributed towards the edges. The background is a dark, reddish-brown color, suggesting the interior of a blood vessel.

IRON DEFICIENCY ANEMIA

INTRODUCTION

- ❑ Iron is an essential part of hemoglobin.
- ❑ Newborn are born with about 500mg of iron in their bodies. By the time they reach adulthood they need to have about 5000mg iron.
- ❑ Children need to absorb an average of 1mg iron per day to keep up with the needs of their growing bodies. Since children absorb only about 10% of the iron they have, children need to receive 8-10 mg of iron per day.
- ❑ Breastfed children need less iron because iron is absorbed 3 times better when it is in breast milk.

Recommended Daily Amounts of Iron, in milligrams (mg)

Age	Male	Female	Pregnancy	Breastfeeding
Birth to 6 months	0.27 mg	0.27 mg		
7 to 12 months	11 mg	11 mg		
1 to 3 years	7 mg	7 mg		
4 to 8 years	10 mg	10 mg		
9 to 13 years	8 mg	8 mg		
14 to 18 years	11 mg	15 mg	27 mg	10 mg
19 to 50 years	8 mg	18 mg	27 mg	9 mg
51 or older	8 mg	8 mg		

DEFINITION

- ❑ Iron deficiency anemia is one of the most common type of anemia which results when the intake of dietary iron is inadequate for hemoglobin synthesis.

INCIDENCE

- ❑ It mostly occurs among prematurely born infants, children between 9-24 months old and the adolescence growth spurt.

CAUSES

Fatigue and
Tiredness



SIGNS AND SYMPTOMS OF **IRON**



Restless Leg
Syndrome

DEFICIENCY



Shortness
of Breath

Frequent
Headaches



Depression



Increased
Sensitivity
to Cold



Hair Loss

Brittle Nails



CLINICAL MANIFESTATIONS

- Pallor of the skin,conjunctiva and mucous membrane,
- Nails becomes thin,brittle and flat,
- Anorexia and failure to thrive,
- Irritability,
- Fatigue,
- Tiredness,weakness



Iron Infusion
can increase
concentrations
of Iron
and
help fight
Anaemia.

CONTD.....

- Anorexia and failure to thrive,
- Vomiting and diarrhea,
- Atrophy of tongue papillae,
- Cardiac enlargement with murmur sound,
- Unhappiness, lack of co-operation,
- Short attention span with poor school performance.



DIAGNOSTIC EVALUATION

- History taking,
- Physical examination

CONTD...

- Blood examination:
 - ❑ Peripheral blood smear shows-microcytic hypochromic RBCs with anisocytosis(abnormal size) and poikilocytosis (abnormal shape).
 - ❑ Reticulocytes count may be normal or reduced.
 - ❑ Hb% is usually low,RBC count is reduced.
 - ❑ WBC and platelets are usually normal.
 - ❑ Serum iron level is low.
 - ❑ Serum ferritin level is decreased.

CONTD...

- Bone marrow study shows absence of hemosiderin or reduced iron granules in sideroblast.
- Iron test reveals elevated total iron binding capacity(TIBC)

MANAGEMENT

- Improvement of dietary intake specially iron and protein containing food.
- Early detection and management of chronic blood loss condition like chronic dysentery, ulcerative colitis.
- Iron therapy: Oral/IM/IV route
- Oral iron therapy is given with elemental iron dose 3 to 6 mg /kg/day in divided doses between meal for 3 to 6 months
- Blood transfusion in severe cases.
- Deworming should be done.

iron deficiency anemia

screening
for
anemia

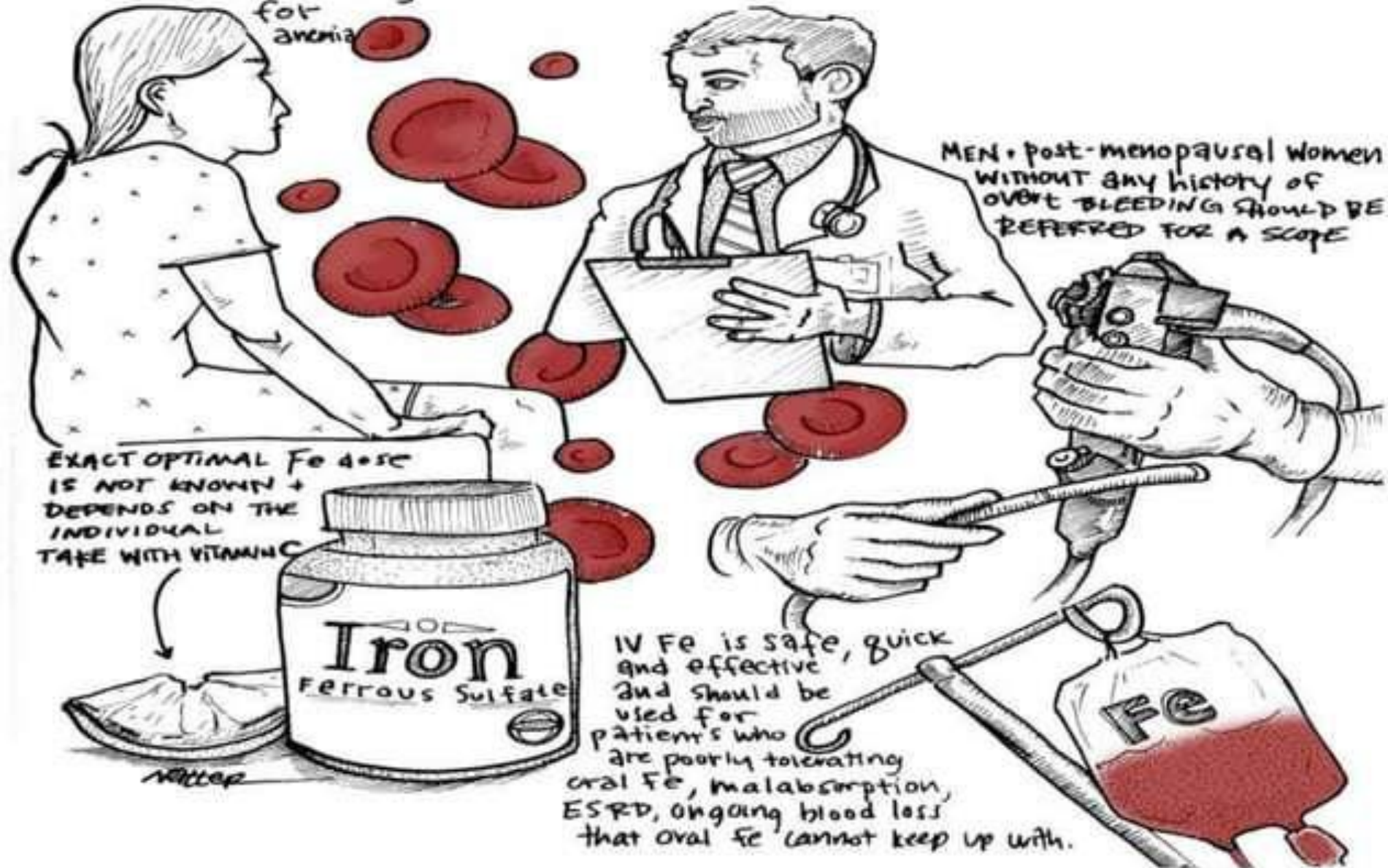
MEN + post-menopausal women
WITHOUT any history of
OVERT BLEEDING SHOULD BE
REFERRED FOR A SCOPE

EXACT OPTIMAL Fe dose
IS NOT KNOWN +
DEPENDS ON THE
INDIVIDUAL
TAKE WITH VITAMIN C

IV Fe is safe, quick
and effective
and should be
used for
patients who
are poorly tolerating
oral Fe, malabsorption,
ESRD, ongoing blood loss
that oral Fe cannot keep up with.



Walter



MEGALOBLASTIC ANEMIA

Normal Anemia



Megaloblastic Anemia



DEFINITION

- The megaloblastic anemia is characterized by presence of oval macrocytic and hyper-segmented polymorphs in peripheral blood smear and megaloblasts in the bone marrow.

INCIDENCE

- It is more common in children between 1-3 year.

CAUSES

- Deficiency of folic acid and vitamin B12
- Lack of secretion of intrinsic factors in stomach
- Malabsorption syndrome
- Prematurity
- Diarrhoeal diseases
- Antifolic acid agent like methotrexate

CLINICAL FEATURES

- ❑ Signs of anemia with;
- ❑ Irritability,
- ❑ Severe anorexia, failure to thrive,
- ❑ Features of neurological involvement like ataxia, parasthesis of hands and feet, loss of sensation, absent tendon reflex

DIAGNOSIS

- ❑ History taking,
- ❑ Physical examination,
- ❑ Serum vitamin B12 level diminished,
- ❑ Serum folic acid level decreased,
- ❑ Bone marrow study

MANAGEMENT

- Administration of folic acid and vitamin B12 by oral or parenteral route.
- Vitamin 'C' also need to be administered.
- Associated causative factors should be managed.
- Dietary improvement is essential.

SICKLE CELL ANEMIA



**Normal
red blood cell**



**Sickle
cell**

Normal Cell



Normal Hemoglobin

Sickle Cell



Abnormal Hemoglobin



Blockage

INTRODUCTION

- In sickle cell anemia, an abnormal gene results in production of an irregular red blood cell called hemoglobin(Hg)s that replaces some of the normal hemoglobin(Hg).
- The RBC collapse into a crescent shape (sickling) when stressed during dehydration, hypoxemia.
- When cell becomes sickle, it obstructs small blood vessels and blocks blood flow.
- These cells have a short life span causing low blood count anemia.

CONTD...

- This condition is an autosomal recessive condition requiring the gene from both parents.
- It is chronic illness with distress resulting from blocked and inadequate circulation and tissue/organ damage that causes pain and over time organ failure and death.

DEFINITION

- Sickle cell anemia is an autosomal recessive disorder in which an abnormal hemoglobin (Hb) causes chronic hemolytic anemia, with a variety of severe clinical consequences.
- Sudden and severe hemolysis in sickle cell anemia is termed as hemolytic crisis.

CAUSE

- ❑ One and main cause of sickle cell anemia is hereditary.

SIGNS
&
SYMPTOMS

DIAGNOSIS

- History Taking
- Physical Examination
- Presence of sickle shaped RBC in peripheral blood smear.
- Hbs is detected by electrophoresis.
- Antenatal diagnosis is possible by chorionic villi sampling.
- Electrolyte imbalance.

MANAGEMENT

- ❑ Blood transfusion,
- ❑ Parenteral fluid therapy,
- ❑ Treatment of infection,
- ❑ Oxygen supplementation,
- ❑ Pain medication,
- ❑ Electrolyte replacements,
- ❑ Bed rest,
- ❑ Bone marrow transplantation.

APLASTIC ANEMIA

DEFINITION

- ❑ Aplastic Anemia refers to a condition in which all formed elements of the blood are simultaneously depressed, characterized by pancytopenia or the triad of profound anemia, granulocytopenia and thrombocytopenia.
- ❑ Hypoplastic anemia is characterized by a profound reduction of RBC but normal or slightly decreased WBC and platelets.

CLASSIFICATION

1. Congenital or primary aplastic anemia
2. Secondary or acquired aplastic anemia

CAUSES

- ❑ Infection with human parvovirus (HPV), hepatitis,
- ❑ Radiation therapy
- ❑ Use of chemotherapy, antibiotic (chloramphenicol) sulphonamids, thiazide etc
- ❑ Exposure to industrial or household chemical exposure.
- ❑ Leukemia, lymphoma,
- ❑ Sickel cell anemia,



CLINICAL FEATURES

- ❑ A lack of RBCs is characterized by pallor, weakness, easy fatigability, lethargy, tachycardia, SOB, etc
- ❑ A lack of WBCs is characterized by recurrent infections including opportunistic infection,
- ❑ A lack of platelets is characterized by abnormal bleeding, petechiae, easily bruising, etc



DIAGNOSIS

- ❑ History taking
- ❑ Physical examination
- ❑ Peripheral blood smear reveals pancytopenia or may reveal bicytopenia initially, low reticulocyte count.
- ❑ Bone marrow aspiration and biopsy can be done.
- ❑ Increases serum iron level.

MANAGEMENT

- ❑ Restoring functioning marrow
 - Bone marrow transplantation
 - Immunotherapy; Antilymphocyte globulin or Antithrombocytic globulin or Cyclosporin-A; these modify T-cell suppression and restore bone marrow stem cell function.
- ❑ Supportive management
 - Platelet transfusion
 - Injury/infection prevention measures
 - Personal hygiene technique

NURSING MANAGEMENT

- ❑ **Fatigue related to decreased oxygen supply to the tissues**
 - Observing the child for vital signs and other related features.
 - Positioning the child in upright posture.
 - Providing need based care and assisting in activities of daily living.
 - Promoting rest and sleep.
 - Allowing foods containing more calories and iron.

CONTD...

- ❑ **Altered nutrition less than body requirements related to inadequate dietary intake and chronic blood loss.**
- Providing diet rich in protein and iron according to food preference and availability.
- Giving small amount frequent feed.
- Encouraging the child for positive attempt to take food.
- Administering anthelmintic drugs as prescribed.

CONTD...

- ❑ **Altered growth and development related to decreased energy level and poor general condition.**
 - Ensuring adequate dietary intake and nutritional rehabilitation.
 - Instructing mother to continue care at home and regular weight check up.
 - Explaining about importance of improved dietary intake especially low-cost food item containing high iron and protein.
 - Encourage play and other recreational activities.

CONTD...

- ❑ **Risk for infection related to general weakness.**
 - Promoting hygienic measures and general cleanliness.
 - Avoiding exposure to cold and infection.
 - Maintaining aseptic technique and hand washing practice during care.
 - Administering prescribed antibiotics.

ASSIGNMENT

- ✘ What are the preventive measures to control the incidence of anemia among children?



Huh?



THANK YOU!