Approach to ANAEMIA

By
Dr NAJAF MASOOD

Objectives

- What is anaemia
- Causes
- How to proceed for anaemic pt
- Iron deficiency anaemia

Definition

- A hemoglobin level or red blood cell volume below the normal range for the age and sex.

Normal Range:

Age	Hemoglobin (g/dl)	Hematocrit (%)	MCV (fl)
Cord blood	13.7-20.1	44-55	100
2 weeks	13.0-20.0	42-66	-
3 months	9.5-14.5	31-41	-
6months-6 years	10.5-14.0	33-42	70-74
7-12 years	11.0-16.0	34-40	76-80

Causes

- **Deficient hemopoietic factors**:-
  - Iron deficiency
  - Folate deficiency
  - Vitamin B 12 deficiency

Disorder of hemoglobin synthesis

- Thalassemia
- Sickle cell anaemia

Hemolysis

- **Red cell enzyme deficiency**
  - G6PD
  - Pyruvate kinase deficiency
- **Red cell membrane defect**
  - Hereditary Spherocytosis
- **Autoimmune hemolytic anaemia**

Blood loss

- **Gastrointestinal**
  - Meckles diverticulum
  - Cows milk protein allergy
- **Parasites**
  - Hook worms
- **Bleeding disorders**
  - Haemophilia
  - Von willibrands disease

Bone marrow Failure

- **Aplastic Anaemia**
  - Fanconi Anaemia
- **Red cell anaemia**
  - Diamond Blackfan
  - Transient erythroblastopenia of childhood

Infection/Inflammation/Chronic illness

- **Malabsorption syndrome**
  - Coeliac disease
- **Chronic inflammatory disorder**
  - JRA
- **Organ failure**
  - Renal failure
- **Malignant disease**
- **Lead poisoning**

Approach to anaemic pt

- History
  - Ask for sign & symptoms
  - Pertinent question about cause
- Non specific
  - Lethargy, headache,breathlessness,palpitation
- Specific
  - Jaundice, diarrhea, bone deformity

- Specific
  - Fever, bleeding, pica, drug
- Nutritional history
- Family history
- Drug history

- Signs
  - Pallor
  - Koilonychia
  - Jaundice
  - Thalassemic fascies
  - Hepatosplenomegaly
  - Signs of CCF
  - Cardiomegaly

Complete blood picture

- Spherocytes
  - Hereditary spherocytosis
  - Autoimmune hemolytic Anaemia
  - Wilson’s disease
- Sickle form
  - Sickle cell disease
- Target cell
  - Hemoglobin SC disease

- Nucleated RBC
  - Beta Thalassemia
- Microangiopathy
  - Hemolytic Uremic Syndrome
- Bite cell/ blister cell
  - G6PD deficiency

- Raised Retic count
  - Hemolysis
  - Blood loss
- Low Retic count
- Assess for RBC size

Microcytic Anaemia

- Iron deficiency
- Beta Thalassemia
- Hemoglobin E disease
- Lead poisoning

Macrocytic

- Folate deficiency
- Vitamin B12 deficiency
- Inborn error of metabolism
- Diamond Blackfan Anaemia
- Congenital dyserythropoetic Anaemia

Normocytic normochromic

- Anaemia of Chronic disease
- Renal failure
- Transient erythroblastopenia of childhood
- Anaemia associated with hypothyroidism

Iron deficiency anaemia

- Anaemia resulting from lack of sufficient iron for synthesis of hemoglobin

- Most common hematologic disease
- Newborn baby…..0.5 gm
- Adult ……5.0 gm
- 0.8 gm iron must be absorbed
- Absorption of dietary iron is 10%
- DRA is 8-10 gm

- Bioavailability of iron in breast milk is 2-3 times better than cow’s milk
- Must add iron containing cereals after 4months of age
- External blood loss

Etiology

- Low birth weight
- Perinatal hemorrhage
- Dietary
- Occult bleeding
- Parasitic infestation
- Pulmonary hemosidrosis
- Cow’s milk protein allergy

Incidence

- Rare before 6 month oef age
- Peak age is 9-24 months

Clinical manifestations

- Pallor
- Pagophagia
- Irritability
- Anorexia
- Poor attention span
- Memory loss

Laboratory Findings

- Bone marrow hemosiderin levels
- Serum ferritin
- Serum iron
- Serum iron binding capacity
- Transferrin saturation
- Reduce MCH & MCV

- Deformed RBCs
- Raised RDW
- Normal WBCs count
- Thrombocytosis

- Hypercellular bone marrow with erythroid hyperplasia
- Normoblasts have scanty, fragmented cytoplasm with poor hemoglobination
- Stool for occult blood

Differential diagnosis

- Beta Thalassemia
- Hemoglobinopathies
- Lead poisoning

Treatment

- 4-6mg/kg/day of elemental iron
- Dietary education
  - 500ml of milk
  - Leafy vegetables
  - Meat
  - Iron fortified formula / cereals

Response to treatment

- Within 12-24 hrs
  - Subjective improvement
- 36-48 hrs
  - Erythroid hyperplasia
- 48-72 hrs
  - Reticulocytosis

- 4-30 days
  - Increase in Hb levels
- 1-3 months
  - Repletion of stores

Blood tansfusion

- Hb level less than 4 gm%
- Frank CCF

Summary

- Is anaemia associated with other hematological abnormalitis
- Is there associated reticulocytosis
- Review of peripheral smear
- Is it associated with reduce retic count
- Microcytic, Macrocytic & normocytic anaemia


Thankyou