Oral manifestations of haematological diseases

Dr. Suhail Al-Amad

1st Mar 2020

Haematology

RBC

- ↑ production
- ↓ production

WBC

- ↑ production
- ↓ production

Platelets

- ↓ production

Complete Blood Count

	Ref Range	Units
RED BLOOD CELL (RBC)	4.5-5.9	Million/cmm
Hemoglobin (Hb)	11.6-16.6	g/dL
Hematocrit (Hct)	40-52	%
Mean Corpuscular Volume (MCV)	80-96	fL
Mean Corpuscular Hb (MCH)	27-35	pg
Mean Corpuscular Hb Concentration (MCHC)	31-36	g/dL
Red Cell Distribution Width (RDW)	11.5-14.9	%
Platelets Count (Plt)	139-450	Thousand/cmm
White Blood Cells Count (WBCs)	4.4-11.3	Thousand/cmm

	Ref Range
Basophils %	Up to 1
Eosinophils %	<7
Neutrophils %	44-75
Lymphocytes %	18-43
Monocytes %	4-10

Erythrocytes

- **Polycythemia;**
  - Increase in RBCs, reflected as ↑ in Hb and Hct.
  - Less common than anaemia.
  - Leads to increase blood viscosity and therefore increased risk of ischemia and thrombosis.
  - Can either be absolute or relative.

Polycythemia (absolute)

Primary:

- **Polycythemia ruba vera**
- Malignant disease of BM where there is an ↑ production of RBC
- Age > 50 years old.
- RBC count 6 to 12 million/mm^3
- Hb 18 to 24g/dl
- Redness of skin and mucous membranes, tinnitus, headache and dizziness.
- Increased risk of thrombosis.
- Tt by venesection, RT and CT.
- Prognosis is very good.

Secondary;

- Increased production of erythropoietin as a physiological compensation to hypoxia.

Polycythemia (relative)

No ↑ in RBCs but ↓ in plasma volume.

Oral and dental considerations

- Risk due to thrombosis.
- Check CBC prior to treatment.
- To prevent complications: Hb should be reduced below 16 g/dl and hematocrit below 47%.
- Special attention to local hemostasis.

Anaemia

- Commonest hematological disease: 30% of the world's population are anaemic (15% are Fe deficient).
- Reduced hemoglobin;
  - M < 13 g/dl; F < 12 g/dl
- Reduced Hematocrit:
  - M < 40%; F < 37%
- Morphological and size changes
  - Specific changes associated with some forms of anaemias.

MCV is the best diagnostic tool for anaemia

- There are two compensatory mechanisms to compensate for anaemia:
  - Increase 2,3 diphosophoglycerate, more O_2 liberated.
  - Hyperdynamic circulation: ↑ HR, VD and stroke volume.
- This will result in heart palpitation and possible heart failure.

Anaemia

- **Hemorrhagic**:

  Blood loss
- **Dyshemopoietic:**

  Defective production of erythrocytes
- **Hemolytic:**

  Increased destruction of erythrocytes

Hemorrhagic anaemias;

- **Anaemia due to blood loss**

  Up to 600 ml can be lost with few symptoms
- **Acute or chronic blood loss**

  Consider underling conditions (bowel cancer)
- **Iron deficiency anaemias mostly resulted from blood loss rather than insufficient intake.**

Dyshemopoietic anaemia;

- **Defective production of erythrocytes:**
  - Inadequate dietary intake
  - Increased requirements
  - Defective absorption
  - Decreased utilization

Dyshemopoietic anaemia;

- Iron deficiency anaemia
- Vitamin B_{12} deficiency anaemia
- Pernicious anaemia
- Folic acid deficiency anaemia
- Toxic dyshemopoietic anaemia
- Leukoerythroblastic anaemia
- Aplastic anaemia

Iron deficiency anaemia

- Most common cause of anaemia worldwide.
- Of the daily diet, only 10% are absorbed. In a normal diet, this equals 1mg.
- Absorption occurs from stomach, duodenum and upper jejunum.
- Approximately 1mg of Fe is lost every day through exfoliation of skin and mucous cells. Menstruation results in an average daily loss of 0.7mg.
- In pregnancy and lactation, requirements ↑ to 2-5mg/day.
- Blood loss is the most important cause of deficiency.

Iron deficiency anaemia

Signs and symptoms;

- Fatigue
- Tachycardia and palpitations
- De-papillated tongue
- Koilonychia
- Dysphagia (Plummer-Vinson syndrome)

Iron deficiency anaemia

- Inadequate dietary intake
  - Meat, eggs, leafy vegetables
- Increased requirements
  - Pregnancy, children, infants
- Defective absorption
  - Hypermobility of the bowel
- Increased loss of iron
  - Gastric disease, menstruation, bladder and colon ca

Vitamin B_{12} deficiency anaemia

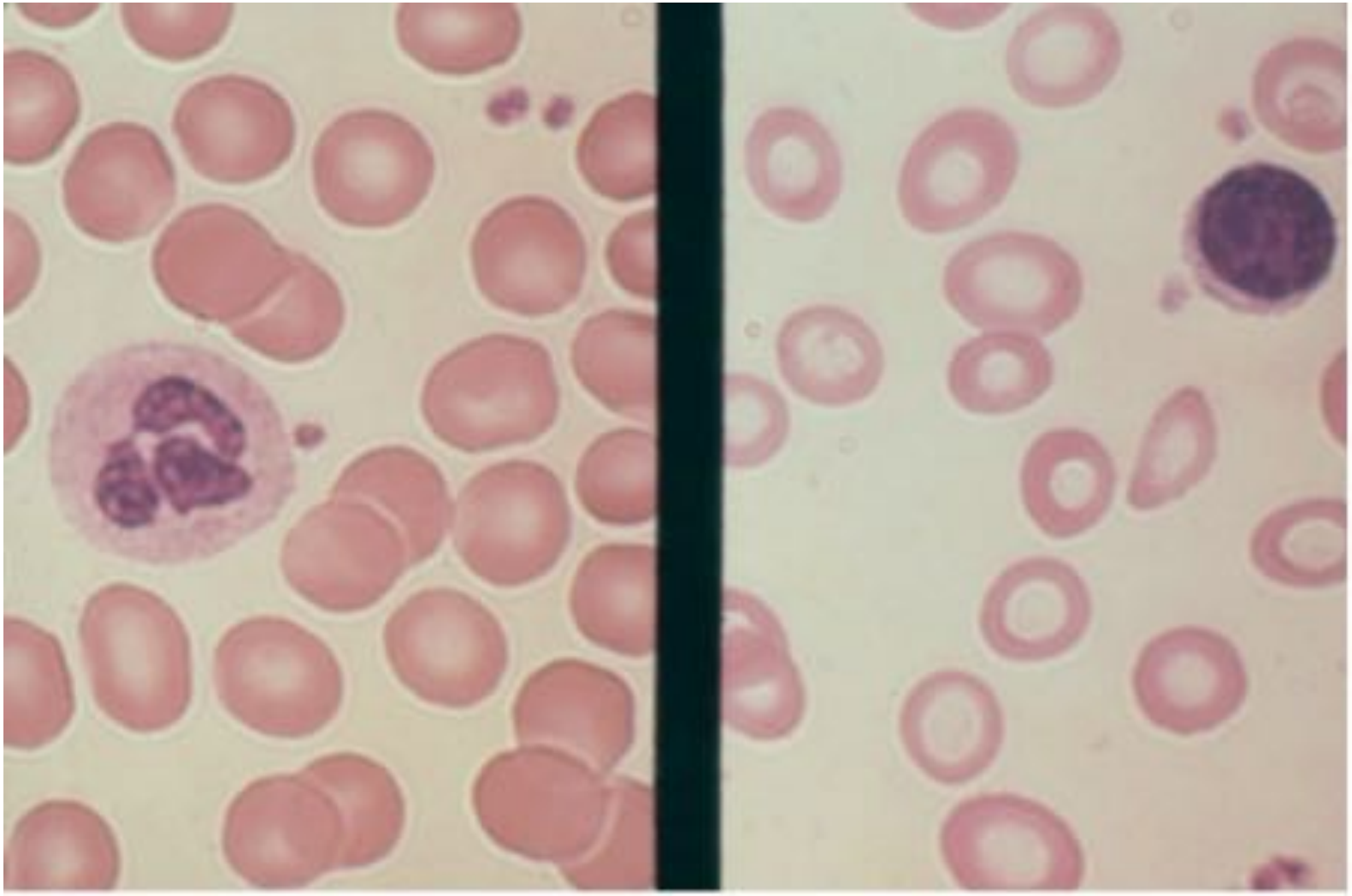
Causes;

- Dietary deficiency
- Decreased production of intrinsic factor
  - Pernicious anaemia
  - Gastrectomy
  - Helicobacter pylori infection
- Competition for vitamin B_{12} in gut
  - Fish tapeworm
- Decreased ileal absorption of vitamin B_{12}
  - Surgical resection
  - Crohn's disease
- Transcobalamin II deficiency

Folic acid deficiency anaemia

- Inadequate dietary intake
  - Lack of leafy vegetables intake
- Increased requirements
  - Pregnancy
  - Children
- Increased loss of FA:
  -Hemolytic anaemia, malabsorption (coeliac dis)
  -alcoholism
- Drugs interfering with DNA synthesis
  - Chemotherapy treatment (MTX) and anticonvulsant (phenytoin)

- According to cell morphology, anaemias can be divided into:
- **Microcytic**: seen in Fe def anaemia where haem synthesis is defective.
- **Macrocytic**: seen in Vit B_{12} and FA def where Haem is normal but there is impaired nuclear maturation.
- **Normocytic**: seen in systemic diseases: def in Vit C, hypothyroidism, chronic inflammatory diseases…etc or BM aplasia/hypoplasia or in BM neoplasms.



Source: Fauci AS, Kasper DL, Braunwald E, Hauser SL, Longo DL, Jameson JL, Loscalzo J:
Harrison's Principles of Internal Medicine, 17th Edition: http://www.accessmedicine.com