

HUMAN ANATOMY AND PHYSIOLOGY-1(BP101T)

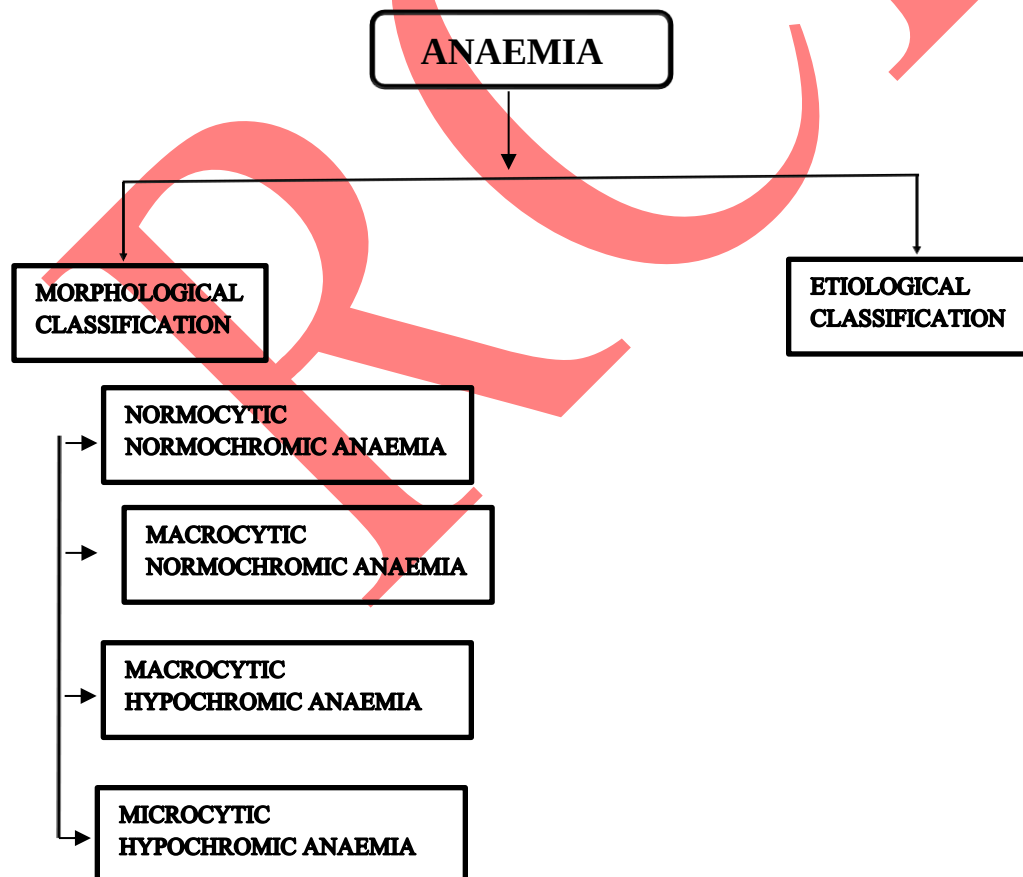
UNIT: 3 BODY FLUIDS AND BLOOD

CLASS: 3

TOPIC – ANEMIA

DEFINITION: Anemia is a condition in which hemoglobin content of blood is decreased below normal level. Normal hemoglobin level: In male: 13-18 gm/100 ml In female: 11.5-16.5 gm/100 ml Generally the anaemia occurs because of 1) Decrease production of R.B.C. 2) Increased destruction of R.B.C. 3) Excess loss of blood from the body.

CLASSIFICATION OF ANAEMIA:



I) MORPHOLOGICAL CLASSIFICATION:

S.NO	TYPE OF ANAEMIA	SIZE OF R.B.C	HAEMOGLOBIN CONTENT	NUMBER OF R.B.C
1.	NORMOCYTIC NORMOCHROMIC ANAEMIA	NORMAL	NORMAL	DECREASES
2.	MACROCYTIC NORMOCHROMIC ANAEMIA	LARGER	NORMAL	DECREASES
3.	MACROCYTIC HYPOCHROMIC ANAEMIA	LARGER	DECREASES	DECREASES AND PALE
4.	MICROCYTIC HYPOCHROMIC ANAEMIA	SMALLER	DECREASES	NORMAL AND PALE

II) ETIOLOGICAL CLASSIFICATION:

1) HEMORRHAGIC ANAEMIA: It is due to hemorrhage or loss of blood. The type of anaemia produced by hemorrhage is normochronic normocytic, where hemoglobin content per RBC is normal. This hemorrhagic anaemia either chronic or acute.

2) HEMOLYTIC ANAEMIA: It is due to excessive or abnormal destruction of red blood cells. ex: chronic malaria produces this type of anaemia.

A) SICKLE CELL ANAEMIA: the abnormal hemoglobin molecule becomes misshaped when deoxygenated, making the erythrocytes sickle shaped. If the cells contain high proportion of abnormal

molecules, sickling is permanent. The life span of cells is reduced by globin synthesis which causes anaemia.

B) THALASSEMIA: there is reduced globin synthesis which results reduced hemoglobin production and increased friability of the cell membrane, leading to early haemolysis.

C) CONGENITAL HEMOLYTIC ANAEMIA: In this disease, genetic abnormality leads to the synthesis of abnormal hemoglobin and increased red cell membrane friability, reducing their oxygen carrying capacity and lifespan. The most common forms are sickle cell anaemia and thalassemia.

3) NUTRITIONAL DEFICIENCY ANAEMIA: It is due to deficiency of nutrition value is called nutrition deficiency anaemia.

A) IRON DEFICIENCY ANAEMIA: the normal daily requirement of iron intake in men about 1 to 2 mg derived from meat and highly colored green vegetables. The daily requirement for women is 3mg because of blood loss during menstruation and to meet the needs of growing fetus during pregnancy. If iron content is decrease in the person it leads to severe decrease in hemoglobin level, is below 9gm/dl blood.

B) PERNICIOUS ANAEMIA: This is the most common type of anaemia due to deficiency of vitamin B12. Maturation of erythrocytes is impaired where deficiency of vitamin B12 and /or folic acid occurs. It occurs most often in female than males usually between 45 to 65 years of age. It is an autoimmune disease in which autoimmune antibodies destroy intrinsic factor and parietal cells in the stomach. This leads to megaloblastic anaemia.

C) FOLIC ACID DEFICIENCY ANAEMIA: This is due to the deficiency of folic acid this leads to the impaired maturation of erythrocytes.

D) MEGALOBLASTIC ANAEMIA: maturation of erythrocytes is impaired where deficiency of vitamin B12 and/ or folic acid this leads to abnormally large erythrocytes called megaloblastic anaemia.

4) APLASTIC ANAEMIA: hypoplastic or aplastic anaemia is due to varying degree of bone marrow failure. Bone marrow function is reduced in hypoplastic anaemia and absent in aplastic anaemia. Since the bone marrow produces leucocytes and platelets as well as erythrocytes. This condition is called pancytopenia. The known cause includes:

- Ionizing radiations like X-Rays
- Viral diseases
- Malignant diseases.
- Drugs like cytotoxic drugs, Anti-inflammatory drugs, Sulphonamides
- Some chemicals like benzene and its derivatives

5) ANAEMIA DUE TO CHRONIC DISEASES: Anaemia associated with chronic diseases like Cancer: in bone marrow cancer or in blood cancer Parasitic diseases like malaria iii) iv) v) Tuberculosis Lungs cancer Several ulcerative conditions.