Erythrocyte (2)

Dr .Reeham Helmy Abdel Sattar

E. Substances Needed for Erythropoiesis

- 1. Iron: Must be in the ferrous state (Fe^{2+}) to transport oxygen
- 2. Amino acids: Globin-chain synthesis
- 3. Folic acid/vitamin B12: DNA replication/cell division
- 4. Others: Erythropoietin, vitamin B6 (pyridoxine), trace minerals

3. Microcytes

a. RBCs less than 6 µm in diameter; MCV less than 80 fL

b. Seen in iron-deficiency anemia, thalassemias, sideroblastic anemia, and anemia of chronic disease

4. Anisocytosis

a. Variation in RBC size, indicating a heterogeneous RBC population (dimorphism)

b. Correlates with RDW (red blood cell distribution width), especially when the RDW exceeds 15.0%

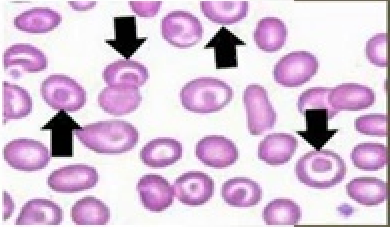
c. Seen post-transfusion, post-treatment for a deficiency (e.g., iron), presence of two concurrent deficiencies (e.g., iron and vitamin B12), and idiopathic sideroblastic anemia

Target cells

a. Show a central area of hemoglobin surrounded by a colorless ring and a peripheral ring of hemoglobin; cells have an increased surface-to-volume ratio

b. Seen in liver disease, hemoglobinopathies, thalassemia, iron-deficiency anemia

c. Caused by excessive cholesterol in the membrane or a hemoglobin distribution imbalance



11 . Sickle cells

a. Shapes vary but show thin, elongated, pointed ends and will appear crescent shaped; usually lack a central pallor area

b. Contain polymers of abnormal hemoglobin S

c. Seen in hemoglobinopathies SS, SC, and S/(β-thalassemia

d. Cell shape is caused by cell membrane alterations due to an amino acid substitution