LEC 7: Hemolytic anemia: its Definition, Types, Causes, Symptoms , and diagnosis?

What is hemolytic anemia?

Hemolytic anemia is a disorder in which red blood cells are destroyed faster than they can be made.

What are the different types of hemolysis?

There are two types of hemolysis. Their names indicate where hemolysis takes place

A.Extravascular hemolysis:

- Red blood cell destruction that takes place outside blood vessels.
- the cells are removed extravascularly by the macrophages of the reticuloendothelial (RE) system, especially in the marrow but also in the liver and spleen..
- The breakdown of haem from red cells liberates iron for recirculation via plasma transferrin to marrow erythoblasts،
- protoporphyrin which is broken down to bilirubin. Bilirubin circulates to the liver where it is conjugated to glucuronides which are excreted into the gut via bile and converted to stercobilinogen and stercobilin(excreted in faeces)

B.Intravascular hemolysis :

- Red cell destruction that happens within your blood vessels.
- The parts of the destroyed cells circulate within blood.

Hemolytic anemia classification

Hemolytic anemia can be inherited or acquired:

A.Inherited hemolytic anemia

B. Acquired hemolytic anemia

A. Inherited hemolytic anemia They are genetic ,They has no therapy ,They are permanent and chronic ,They starting early in the life ,Some starting after 7 month of the birth and Some needs other factors to starting

Types of Inherited hemolytic anemia

1. Related to Hb disorders
2. Enzymopathies: related to enzymes deficiency of RBC (G6PD and PK)
3. Membrane disorders:

1.Hemoglobinopathies:

A. Quantitative defects: absence of one or tow or three or four chain of hemoglobin
B. Structure defects: the abnormality in the sequence of amino acids on the beta chains of hemoglobin only

2. Enzymopathies:

Enzyme Defects: Absence or decreased function of a metabolic enzymes (G6PD or PK)

3. Membrane Defects:

Abnormalities in the proteins that make up the cytoskeleton of the cell membrane

2.Acquired hemolytic anemia

Destruction of red blood cells (RBCs) not due to genetic or congential disorder They has therapy ,They are not permanent ,They are acute ,They starting late in the life

With this type of anemia, Your body makes normal red blood cells, but they are later destroyed

Caused by factors during the life such as

1. Malaria ,Antibodies against RBC ,Toxins ,Chemicals ,Drugs
2. This may happen because of:
3. Certain infections, which may be viral or bacterial
4. Medicines, such as penicillin, antimalarial medicines, sulfa medicines, or acetaminophen
5. Blood cancers , Certain tumors
6. Autoimmune disorders, such as lupus, rheumatoid arthritis, or ulcerative colitis
7. An overactive spleen (hypersplenism)
8. Mechanical heart valves that may damage red blood cells as they leave the heart
9. A severe reaction to a blood transfusion

What are the symptoms of hemolytic anemia؟

Each person's symptoms may vary. Symptoms may include:

Abnormal paleness or lack of color of the skin, Yellowish skin, eyes, and mouth (jaundice), Dark-colored urine

Fever, Weakness, Dizziness, Confusion, inability to do physical activity

Enlarged spleen and liver

Increased heart rate (tachycardia), Heart murmur

How is hemolytic anemia diagnosed?

Two main principles

1. **One is to confirm that it is hemolysis**
2. **Two is to determine the cause**

Diagnosis based on

A. The symptoms,
B. The medical history,
C. The physical exam.
D. The study of hemolysis in the laboratory must include:

1. CBC (anemia)
2. Blood film study
3. Reticulocyte count
4. Plasma hemoglobin (increased)
5. Serum Haptoglobin (HP) (absent)
6. Serum Hemopexin (absent)
7. Methemalbumin (positive)
8. Serum bilirubin

Home Quiz : What's the difference between hemolytic anemia and autoimmune hemolytic anemia?

Dr- Raghda Hameed Jasim **DR-Thabat Rayes Ashkah**

Path/ Heamatology M.B.Ch .B-F.I.B.M.S