AL-MUSTAQBAL UNIVERSITY

Department of Medical laboratory Techniques Department

Clinical Biochemistry (4th stage)

(Determination of bilirubin)

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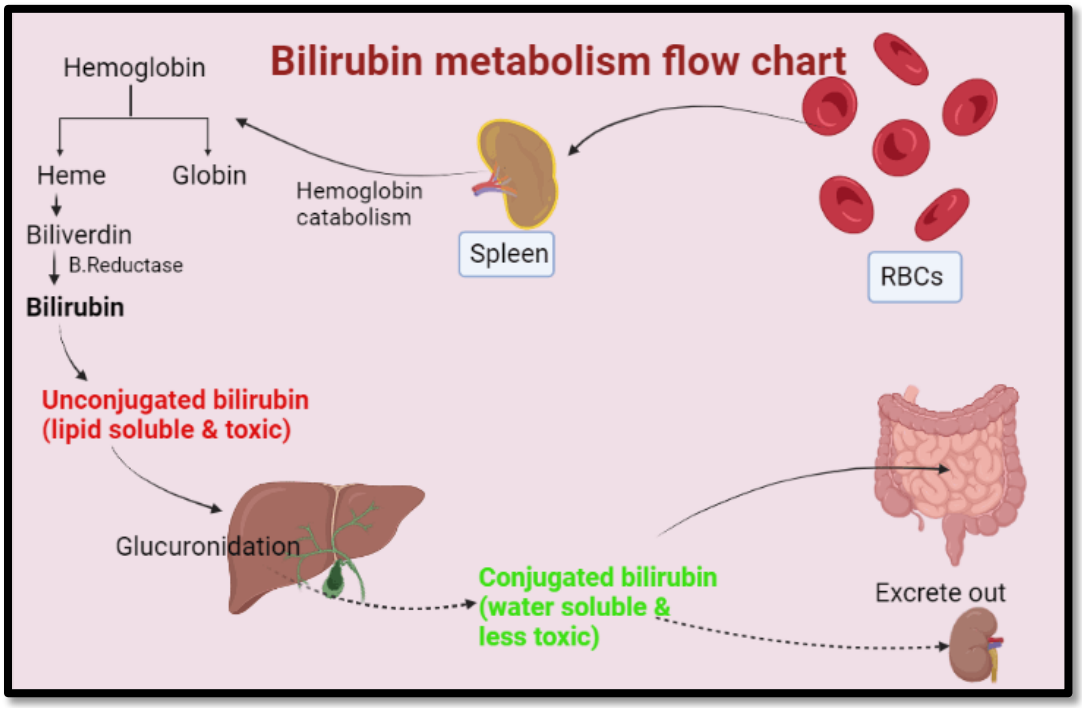
Bilirubin

Bilirubin is a yellow breakdown product of normal heme catabolism. Its levels are elevated in certain diseases and it is responsible for the yellow color of bruises and the brown color of feces.



The bilirubin molecule formed in the spleen is non-polar and only a slightly soluble in water at the body pH, therefore, it's called free unconjugated or indirect reacting bilirubin. To transfer from the spleen to the liver, it must be soluble, therefore, free bilirubin form a complex with albumin and dissociates in the liver, where bilirubin conjugates with glucuronic acid by glucuronlytransferase enzyme .The resulting polar water-soluble bilirubin is glucuronide which also known as conjugated or direct reacting bilirubin.

Measurements of plasma bilirubin:

• Serum bilirubin concentration depends on the rate of removal of bilirubin from destruction of hemoglobin.

• A bilirubin test measures the amount of bilirubin in a blood sample.

• Total and direct bilirubin levels can be measured from the blood, but indirect bilirubin is calculated from the total and direct bilirubin.

Types of bilirubin in serum

Direct bilirubin: conjugated (water-soluble bilirubin) Reference range: 0.0-0.2 mg/dl.

Indirect bilirubin: is unconjugated (water insoluble bilirubin) Reference range: 0.2 -0.8 mg/d

Total bilirubin = d + i.d.

Reference range: 0.2-1.0 mg/dl.

A high level of bilirubin in the blood may be the result of a health problem in the liver, gallbladder, or bile ducts, or due to some health problems that lead to an increased rate of breakdown of red blood cells in the blood.

Below is a statement of some of the reasons that may lead to a high level of bilirubin in the blood :

1_Exposure to toxicity as a result of taking some types of medications.

2_Suffering from various liver diseases, such as hepatitis.

3_Cirrhosis, which is characterized by scarring of liver tissue.
4_Formation of gallstones.

5_Having gallbladder

6_pancreatic cancer.

7_Genetic Gilbert's syndrome.

8_Biliary stricture, where severe narrowing in parts of the bile duct makes it difficult for fluids to pass through it.

9_Blood transfusion reaction, which is an immune reaction that occurs as a result of the immune system attacking blood transferred from one person to another.

11_Suffering from hemolytic anemia. Where large amounts of red blood cells are dissolved to the point that the liver is not able to deal with the high amount of bilirubin in the blood.

11_Jaundice a term used in clinical medicine to describe a condition in which the skin and sclera appear yellow. Too much bilirubin in a newborn baby can cause brain damage, hearing loss, problems with the muscles that move the eye, physical abnormalities, and even death. some babies who develop jaundice may be treated with special lights (phototherapy) or a blood transfusion to reduce their bilirubin levels.