Objectives of this lecture is to:

- List the major functions of the liver.
- Define Jaundice & Identify its types.
- Enumerate diseases affecting the structure and functions of the liver.
Functions of the liver

1) General Metabolism of:
   a. Carbohydrates.
   b. Fat.

2) Synthetic functions:
   a. Plasma proteins.
   b. Coagulation factors.

3) Excretion & detoxification of:
   a. Steroid hormones.
   b. Drugs.

4) Storage of:
   a. Vitamins
   b. Iron.

5) Metabolism & excretion of bilirubin.
Heme Catabolism

Red Blood Cells
   ↓ Hemoglobin
       ↓ Heme
           ↓ Bilirubin
               ↓ Liver
                   ↓ Gall bladder
                       ↓ bile duct
                           ↓ Small Intestine

Kidney
       ↑ Urobilinogen
           ↑ Urobilinogen excreted
               ↓ Large Intestine
                   ↓ Stercobilin
Formation of bile

Cholesterol $\rightarrow$ 7-α-Hydroxycholesterol

Primary bile acids
- Cholate
- Chenodeoxycholate

Taurine/glycine conjugate

Deconjugation by intestinal bacteria

Secondary bile acids
- deoxycholate
- Lithocholate
Efficient excretion of the end products of metabolism and of bilirubin depends on:

1. Normally functioning liver cells.
2. Normal blood flow to/through the liver.
Jaundice

Yellowish discoloration of skin, nail bed and sclera due to increase bilirubin level in the blood.

Types of Hyperbilirubinemia:

1. Unconjugated:
   i. Hemolytic.
   ii. Neonatal: physiological

2. Conjugated: obstruction.
   i. Intra-hepatic.
   ii. Extra-hepatic.
Diseases of the Liver

1) Hepatitis:

i. Acute Hepatitis:
   1. Viral hepatitis (A, B, C, D, & E)
   2. Toxins (alcohol & drugs)

ii. Chronic hepatitis: hepatic inflammation persisting for more than six months.
   1. Infection (hepatitis B & C)
   2. Autoimmune hepatitis
   3. Toxins (alcohol).
Diseases of the Liver

2) Hepatic failure:
   
i. Acute Fulminant hepatic failure.
   
   ii. Chronic: (Cirrhosis) fibrosis causing permanent damage to hepatic tissue.

3) Cholestasis:
   
i. Intra-hepatic: caused by infection.
   
   ii. Extra-hepatic: obstruction of bile duct by (gallstone or tumor).
Diseases of the Liver

4) Fatty liver diseases:
   i. Alcoholic liver disease.
   ii. Non-alcoholic steatotic hepatitis (NASH) caused by DM and/or obesity.

5) Tumors:
   i. Primary (hepatocellular Carcinoma).
      • $\alpha$-fetoprotein would be positive in 70% of cases.
   ii. Secondary (metastatic deposits).
Diseases of the Liver

6) *Inherited diseases:*

   i. Gilbert's disease: present in 5-7% of normal population.
   
   ii. Criggler-Najjar syndrome.

7) *Uncommon liver diseases:*

   i. Wilson's disease.
   
   ii. Hemochromatosis.
Diseases of the Liver

8) Liver diseases in children: Neonatal jaundice:
   i. Physiological.
   ii. Pathological.

9) Liver diseases in Pregnancy:
   i. Hyperemesis gravidarum.
   ii. Pre-eclampsia/Eclampsia:
       (HELLP syndrome).
References

