Liver and biliary tract disorders

Synthesis of plasma proteins

Albumin, prealbumin, transferin, coagulations factors….

Detoxication reactions of endogen toxic substances

Ammonia-urea cycle, bilirubin-clearance, bilirubin-conjugation

Detoxication reactions of exogen toxic substances

Toxic substances from environment; drugs ….

Barriere function
Barriere between gut (environment) and systemic circulation

Digestive functions
Bile production;
(bile is a complex mixture of bilirubin, bile acids, cholesterol, lecithin and electrolytes)

Metabolic center for glycids, fats and proteins metabolism

Bilirubin

is metabolic product of heme catabolism.

It is conjugated with glucuronic acid in the liver and extreted into the bile.

Bilirubin mono- and di- glucuronid is more water soluble and is easy excreted .

Hyperbilirubinemia

Icterus

Jaundice

prehepatic
hepatic
posthepatic

} **causes of hyperbilirubinemia**

Prehepatic causes of hyperbilirubinemie

adults
newborns

Adults

Increased production of unconjugated bilirubin
Intravascular hemolysis
Hemolytic anemia

Laboratory diferencial diagnosis.
Increas of unconjugated bilirubin
Urine: bilirubin neg.; urobilinogen posit.
Signs of anemie
Decreas of haptoglobin i plasma

Newborns

Neonatal jaundice; icterus neonatorum; physiologic jaundice-icterus
Massive destruction of erythrocytes with fetal hemoglobin
Low activity of bilirubin glucuronyltransferase

Pathological icterus associated with Rh incompatibility

Hepatic causes of hyperbilirubinemia

Alcoholic liver disease
Acute and chronic alcoholic hepatitis
Viral hepatitis A, B, C
Toxins (fungi, mushrooms))
Drugs
Autoimmune diseases.

Inborn diseases

Gilbert syndrom (unconjugated hyperbil.)
Crigler-Najjar syndrome (unconjugated hyperbil.)
Dubin-Jonson syndrom (conjugated hyperbil.)
Rotor syndrome (conjugated hyperbil.)

Posthepatic causes of hyperbilirubinemia

Cholestasis is defined as impaired bile flow from the liver to the intestine.

Intrahepatic cholestasis

Intrahepatic cholestasis of pregnacy,
drug induced cholestasis-phenothiazines, androgens
Cholestatic forms of hepatitis

Extrahepatic biliary obstruction

Mechanical obstruction to the bile flow – choledocholithiasis (gallstones)

Carcinomas of the gallblader, pancreatic head, Vaters papila

Liver flukes (parasits)

Inborn anatomic deformations of the biliary tract
- Biliary atresia

Tests of hepatic synthetic capacity

The liver synthesizes a number of plasma proteins.

Total plasma protein
Albumin
Prealbumin
Coagulation proteins (factors)

Albumin.

is synthesized exclusively in the liver.

Causes of hypoalbuminemia

decreas production by the liver

protein malnutrition
loss from the skin, kidney, gastrointestinal tract

Prealbumin

is synthesized by the liver

acts as a transport protein for thyroxin and vit. A

short half-life (1-2 days)

small body pool

Good and reliable indicator of hepatic synthetic capacity

Liver enzymes

enzymes indicate hepatocellular damage
ALT, AST

enzymes indicate cholestasis and obstruction
ALP, GGT