Liver, Gallbladder and Pancreas diseases

Premed 2
Pathophysiology
Pancreas
Pancreatitis

- Acute Pancreatitis
  - Autodigestion of the pancreas due to activation of the enzymes
  - Hemorrhagic fat necrosis, calcium soaps, pseudocysts
  - Increased risk in gallstones, alcohol intake
  - Increased serum amylase

- Chronic Pancreatitis
  - Almost always associated with alcohol intake
  - Fibrosis of the parenchyma, calcification
  - Abdominal pain, back pain
  - Steatorrhea (due to low lipase)
  - Deficiency of fat-soluble vitamins
Cancer of the Pancreas

• Most common type: adenocarcinoma
• Common in smokers
• Most common site: head of the pancreas
• Abdominal pain radiating to the back

• Obstructive jaundice
• Palpable gallbladder
• Death in 1 year
Gallbladder
Cholecystitis

- Acute cholecystitis
  - Most common type: pyogenic
  - Right upper quadrant pain
  - Epigastric pain
  - fever
  - vomiting
  - Increase WBC

- Chronic cholecystitis
  - Thick gallbladder wall
  - Fibrosis
  - Complication of gallstones
Gallstones

- Cholelithiasis
- 4 F’s: fat, female, forty, fertile
- Stone types:
  - 1. cholesterol stones: solitary, large
  - 2. pigment stones: excess unconjugated bilirubin; hemolytic anemia
  - 3. mixed stones: most common; cholesterol + calcium salts
Gallstones

- Asymptomatic, silent or with fatty food intolerance
- Complications:
  - Bilary colic
  - Jaundice
  - Ascending cholangitis
  - Cholecystitis
  - Acute pancreatitis
  - Gallstone ileus
  - Mucocoele
  - Malignancy
Cancer of the Gallbladder

• Primary tumor: adenocarcinoma
• Associated with gallstones
Liver
Jaundice

• Physiologic jaundice of the newborn
• 1st week of life
• Immature liver has less glucoronyl transferase $\rightarrow$ increased UNCONJUGATED bilirubin
• More severe in preterm infants

• Congenital hyperbilirubinemias
• Gilbert syndrome: most common
• Crigler-Najjar syndrome
• Dubin-Johnson syndrome
• Rotor syndrome
Congenital hyperbilirubinemias

UNCONJUGATED BILIRUBIN

- GILBERT SYNDROME
  - REDUCED ENZYME ACTIVITY
  - DECREASED UPTAKE OF BILIRUBIN
  - LIVER MAY BE NORMAL
  - MODERATE ELEVATION OF BILIRUBIN

- CRIGLER-NAJJAR
  - SEVERE
  - ABSENCE OF THE ENZYME
  - EARLY DEATH
  - KERNicterus

CONJUGATED BILIRUBIN

- DUBIN-JOHNSON
  - DEFECTIVE BILIRUBIN TRANSPORT
  - BLACK LIVER

- ROTOR
  - SIMILAR TO DJ
  - NO PIGMENT
Acute Viral Hepatitis

- Jaundice
- Increased levels of AST (aspartate aminotransferase) and ALT (alanine aminotransferase)
- Body weakness
- Fever
- Abdominal pain
- Loss of appetite
# Viral Hepatitis - Overview

<table>
<thead>
<tr>
<th>Type of Hepatitis</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of virus</td>
<td>feces</td>
<td>blood/blood-derived body fluids</td>
<td>blood/blood-derived body fluids</td>
<td>blood/blood-derived body fluids</td>
<td>feces</td>
</tr>
<tr>
<td>Route of transmission</td>
<td>fecal-oral</td>
<td>percutaneous permucosal</td>
<td>percutaneous permucosal</td>
<td>percutaneous permucosal</td>
<td>fecal-oral</td>
</tr>
<tr>
<td>Chronic infection</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Prevention</td>
<td>pre/post-exposure immunization</td>
<td>pre/post-exposure immunization</td>
<td>blood donor screening; risk behavior modification</td>
<td>pre/post-exposure immunization; risk behavior modification</td>
<td>ensure safe drinking water</td>
</tr>
</tbody>
</table>
Hepatitis F

• The occurrence of sporadic cases of non-ABCDE hepatitis gave reason to suspect the existence of another hepatotropic virus to of investigators in England, Northern Italy, France, United States and India.

• The infection was not only sporadic but also enterically transmitted.

• The first report came from India in 1983
Hepatitis G

- RNA virus
- May coexist with other hepatitis viruses
- Mostly with HCV
- Bloodborne
- Discovered 1995 in Chicago
Hepatitis H

• 10-15% of chronic hepatitis patients do not fit into any of the other hepatitis virus categories.
Liver cirrhosis

- cessation of enzymatic processes in the liver
- Ascites, jaundice, internal bleeding, and hepatic encephalopathy
- Patients with decompensated cirrhosis are candidates for liver transplantation
Normal Liver, Fatty Liver, and Cirrhosis
Fulminant hepatitis.

• occurs in 1% of acutely infected individuals; more likely if HBV and HDV coinfect.
• more severe symptoms, can be fatal.
• severe liver damage: ascites and bleeding;
• liver shrinkage rather than hepatomegaly.
Chronic hepatitis

- Persistence of abnormalities for more than 6 months
- May result from any of the hepatitis virus EXCEPT HAV and HEV
Fatty liver

• Microvesicular type:
  pregnancy
  tetracycline
  Aspirin toxicity: Reye syndrome
• Macrovesicular type:
  fatty change (steatosis) in alcoholics
  alcoholic hepatitis
Alcoholic hepatitis

• Fatty change
• Focal liver cell necrosis
• Infiltrates of neutrophils
• Mallory bodies: eosinophilic hyaline inclusions in the liver cell cytoplasm
Cirrhosis

• Scarring and nodule formation in the liver
• Increased incidence of hepatocellular carcinoma
• Etiologic agents:
  prolonged alcoholic intake
drugs, chemicals
viral hepatitis
biliary obstruction
hemochromatosis
Wilson disease
heart failure
Alcoholic cirrhosis

• Jaundice, mixed type
• Low serum albumin
• Coagulation problems
• Increased estrogen levels
• Esophageal varices
• Rectal hemorrhoids
• Caput medusae
• Splenomegaly
• Peripheral edema, ascites, hydrothorax
• Encephalopathy-asterixis, confusion, coma
Alcoholic cirrhosis

- Liver enlarged OR small, shrunken
- Micronodular
- hobnail
Hemochromatosis

- Hereditary type: mutation of Hfe gene on chromosome 6
- Defect of iron absorption in the intestinal mucosa
- Bronze diabetes: cirrhosis
  - diabetes
  - increased skin pigmentation
- Increase in serum iron
- Decreased TIBC
- Increased transferrin iron saturation
- Increased serum ferritin
Wilson disease

- Hepatolenticular degeneration
- Decrease in serum ceruloplasmin, increase serum copper
- Copper deposits in liver, cornea
- Also in brain and kidney
Cancer of the liver

- Most common: Hepatocellular carcinoma
- In association with existing cirrhosis, especially by HBV
- Other cause: Aflatoxin
- Serum marker: alpha-feto protein