Gastrointestinal System: Accessory Organ Disorders

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Disorders of Accessory Organs
Portal Hypertension

Definition

– Abnormally high blood pressure in the portal venous system due to resistance to portal blood flow

• Prehepatic
  – Thrombosis or narrowing of portal vein

• Intrahepatic
  – Changes in liver vasculature
  – Liver tissue changes (hepatitis, cirrhosis)

• Posthepatic
  – RH failure
Disorders of Accessory Organs
Portal Hypertension

Complications (Chronic portal HTN)

– Varices
  • Lower esophagus, stomach, rectum
– Splenomegaly
– Ascites
– Hepatic encephalopathy
– Jaundice
Disorders of Accessory Organs
Hepatorenal Syndrome

Definition
– Renal failure 2° advanced liver disease

Pathophysiology
• Oliguria
  – ↓ volume 2° GI bleed
• Sodium and water retention
  – Ascites
  – Peripheral edema
• Hypotension
  – ↓ volume 2° GI bleed
  – Excessive diuretic use (ascites,edema)
• Peripheral vasodilation
  – ↑ nitric oxide
Liver Disorders
Viral Hepatitis

Definition
– Systemic viral disease
– Primarily affects liver

Types
– Hepatitis A
– Hepatitis B
– Hepatitis C
– Hepatitis D, E, and G
Liver Disorders
Viral Hepatitis A

Transmission
- Fecal-oral route
- Risk factors
  - Crowded, unsanitary conditions
  - Food and water contamination
- Incubation - 4-6 weeks
- Contagious up to 3 months after onset of symptoms

Antibody development
- ↑IgM (immediate) and IgG (permanent)
Liver Disorders
Viral Hepatitis B

Transmission
– Infected blood, body fluids, contaminated needles
– Maternal transmission during the third trimester

Prevention
– Transmission and development prevented by
  • Hepatitis B vaccine
  • Clean needle programs
  • Sophisticated testing of blood products
Liver Disorders
Viral Hepatitis C

Transmission
- Parenteral only
- Post-transfusion
- IV drug users

Characteristics
- 50% to 80% result in chronic hepatitis
Liver Disorders
Viral Hepatitis D, E, G

Hepatitis D
– Delta virus
– Depends on hepatitis B for replication
– Common in IV drug users

Hepatitis E
– Fecal-oral transmission
– Developing countries

Hepatitis G
– Recently discovered
– Parentally and sexually transmitted
Liver Disorders
Viral Hepatitis

Pathophysiology
– Liver alterations:
  • Hepatic cell scarring, fibrosis, and necrosis
  • Mononuclear phagocytic infiltration
  • Kupffer cell hyperplasia

– Cellular injury
  • Cell-mediated immunity

– Inflammatory process
  • Damage to liver parenchyma and bile capillaries
    – Cholestasis
    – Obstructive Jaundice
Liver Disorders
Viral Hepatitis

Clinical Sequence

– Incubation phase
  • Variable for each type

– Prodromal (preicteric) phase
  • 2 weeks after exposure
  • Severe GI symptoms

– Icteric phase
  • Begins 3-4 weeks after exposure
  • Lasts 2-6 weeks
  • Jaundice

– Recovery phase
  • 6-8 weeks
  • Resolution of jaundice
Liver Disorders
Cirrhosis

Description
– Irreversible, inflammatory disease
– Disrupts liver function and structure
  • Nodular tissue
  • Fibrosis

Pathophysiology
– Obstructed biliary channels ➔ portal HTN
– Portal HTN ➔ blood can be shunted away from the liver ➔ hypoxic necrosis
Liver Disorders
Alcoholic Cirrhosis

Pathophysiology
– Oxidation of alcohol damages hepatocytes
– Precursor - Chronic alcoholic hepatitis

Persistent inflammation, degeneration and necrosis of hepatocytes
↓
Fibrosis
↓
Cirrhosis
Liver Disorders

Biliary Cirrhosis

Biliary (bile canaliculi and ducts)

- **Primary** biliary cirrhosis
  - Autoimmune destruction of hepatocytes
  - Sx (if present) $\rightarrow$ obstructed bile flow
    - Jaundice, pruritis, fatigue, abdominal pain, steatorrhea

- **Secondary** biliary cirrhosis
  - Prolonged partial or complete common bile duct obstruction
    - Accumulation of bile in liver
    - Necrosis $\rightarrow$ inflammation $\rightarrow$ fibrosis $\rightarrow$ cirrhosis
Liver Disorders
Cirrhosis

Clinical Manifestations

– Liver inflammation
  • Generalized Sx (pain, fever, fatigue, N/V)

– Liver fibrosis and scarring
  • Portal HTN
  • Portal HTN Sx (ascites, edema, varices, splenomegaly)

– Liver necrosis
  • Alterations in nutrient metabolism
  • Alterations in bile metabolism, storage, obstruction
  • Liver failure → hepatic encephalopathy → death
Gall Bladder Disorders
Cholecystolithiasis

Definition
- Gallstone formation

Pathophysiology
- Formed by hardened aggregates of bile substances
  - Cholesterol
  - Pigment stones (calcium salts of bilirubin, phosphate, carbonate and other anions, )
    - Cirrhosis
    - RBC hemolysis
- Stones lodge in cystic or common bile duct
  - Pain
  - Cholecystitis
Gall Bladder Disorders
Cholecystitis

Pathophysiology (Acute/chronic)
– Inflammation of gall bladder
– Gallstone in cystic duct
– Pressure from stone ➔ ischemia ➔ necrosis
– Can perforate gall bladder
Pancreas Disorders
Pancreatitis

Pathophysiology

– Inflammation of pancreas

– Associated with other clinical disorders

Pancreatic cell injury ↓

Leakage of pancreatic enzymes into the pancreatic tissue ↓

Autodigestion of pancreatic tissue ↓

Enzymes leak into the bloodstream ↓

Injury to blood vessels and other organs
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