Assessment and Management of Patients With Hepatic Disorders

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Liver Cells

- Hepatocytes – 2/3 of liver mass and does most of the liver functions
- Kupffer cells – engulf particulate matter (bacteria) that enter the liver through portal blood
- Ito cells – fat-storing cells

Figure 39-5, pp. 931
Direct bilirubin, D-Bil: < 0.4 mg/dL

Indirect bilirubin, I-Bil: 0.1-1 mg/dL

Total bilirubin, T-Bil: 0.4–1.2 mg/dL
Blood cells
RBC (destruction by macrophage system)

Hemoglobin

Unconjugated bilirubin
Insoluble so attached to albumin

Liver
Unconjugated bilirubin combines with glucuronic acid to become conjugated bilirubin (soluble)

Intestines
Bilirubin reduced to urobilinogen by intestinal bacteria

Excreted in bile; travels to liver via portal (enterohepatic) circulation

Small amount of urobilinogen goes via systemic circulation to kidneys and excreted in urine

Kidney
Urine

Recycled in bile; travels to liver via portal (enterohepatic) circulation

Stool
OUTLINE - BILE PIGMENT PRODUCTION PATHWAY IN HEALTH

HEMOGLOBIN

- amino acids recycled
- globin
- home
- Fe recycled
- CO expired
- In reticuloendothelial cells: spleen, bone marrow, liver

GREEN
- biliverdin
- CO expired

YELLOW
- bilirubin

OTHER TISSUES
- e.g. adipose, skin, sclera etc

Kidney
- Urine colourless urobilinogen
- 1-4mg/day

Circulating bilirubin-albumin complex
- In blood plasma

In hepatocytes

Bilirubin-ligandin complex

Bilirubin-glucuronide

Biliary tree
- Bile duct (Gall bladder)
- Duodenum
- Small intestine

NO COLOUR urobilinogen & sterobilinogen

Colon

DARK RED-BROWN sterobilin
- urobilin
- ~260mg/day
- Faeces

impair bilirubin conjugation
Pathogenesis of Ascites

Figure 44-7, pp.1105
Paracentesis

Sites for insertion of trocar

http://www.youtube.com/watch?v=yhS9Utz4KWk
**TIPS**

Insertion of transjugular intrahepatic portosystemic shunt

- A short-term measure to control portal hypertension (varices & ascites)
- Using a stent to channel blood between portal and hepatic vein and bypassing liver (increases risk for hepatic encephalopathy)
Tips pre

Tips post

http://www.youtube.com/watch?v=ZdjY8IR1y0A&feature=PlayList&p=FAFA4537079E0ABC&playnext=1&playnext_from=PL&index=25
PORTAL SYSTEMIC ENCEPHALOPATHY (PSE)

HEPATIC ENCEPHALOPATHY (HEPATIC COMA)

Problem ↑ By:
- ↑ Protein
- Infection
- Hypovolemia
- Hypokalemia (↓ K)
- GI Bleeding

Blood Ammonia

Changes in LOC
- Progressive Confusion
- Stuporous
- Impaired Thinking & Judgment

Neuromuscular Disturbances
- Asterixis
  “Liver Flap”
- Hyperreflexia

Treatment

Protein in diet
Give Lactulose & Neomycin

Where Am I?
Pathogenesis of Bleeding Esophageal Varices

Portal hypertension (caused by resistance to portal flow and increased portal venous inflow)

Development of pressure gradient of 12 mm Hg or greater between portal vein and inferior vena cava (portal pressure gradient)

Venous collaterals develop from high portal system pressure to systemic veins in esophageal plexus, hemorrhoidal plexus and retroperitoneal veins

Abnormal varicoid vessels form in any of above locations

Vessels may rupture causing life-threatening hemorrhage
Balloon Tamponade: Sengstaken-Blakemore Tube

Compression of bleeding esophageal varices
Endoscopic Sclerotherapy

Sclerosing agents injected into the varices, thereby obliterating the varices.
Esophageal Banding

A rubber band-like ligature is slipped over an esophageal varix via an endoscope.

Necrosis results, and the varix eventually sloughs off.
HEPATITIS

A
Hepatitis with a vowel comes from the bowel.

Transmission: Fecal, Oral

Vaccine-A Yes
Vaccine-E No

Ss: (All Types)
RUQ, Discomfort
GI-N/V
Anorexia
Weight Loss
Fever
Chills
Jaundice
Dark Urine
History of potential exposure

B
Hepatitis B
Body fluids

Transmission: Blood,
Semen,
Saliva

Vaccine-B Yes

C
Hepatitis C
(HCV)
Circulation

Transmission: Blood, Semen

Vaccine-C No

D
Hepatitis D
Super infection with HBV

Transmission: Blood

Vaccine-D No

TX: (All Types)
Rest
Activity as tolerated
Nutrition
Hydration

DX: Presence of specific antibody / antigen in serum

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CIRRHOSIS:
LATER CLINICAL MANIFESTATIONS

- Jaundice
- Changes in Mental Responsiveness & Memory
- Spider Angiomas
  - Face - Neck - Shoulders
- Esophageal Varices
- Anemia
  - Thrombocytopenia
  - Coagulation Disorders
- Ascites
- Collateral Veins Visible
  - On Abdominal Wall
- Hepatomegaly
- Palmar Erythema
- Splenomegaly
- Sexual Characteristics Changes
  - Gynecomastia
  - Hirsuitism
- Hemorrhoids
- Edema
- Peripheral Neuropathy
Liver Transplantation

A

- Cystic duct
- Common bile duct
- Tip of the jejunal Roux-en-Y loop
- Enterotomy for the choledochojunostomy

B

- Portal vein (donor)
- Common bile duct (donor)
- Common bile duct (recipient)
- Hepatic artery (donor)
- Hepatic artery (recipient)
- Portal vein (recipient)

C

- Duodenal drainage tube (T-tube)
- Closed suction drainage tubes
Summary

- NORMAL LIVER
- STEATOSIS: Fatty change, Perivenular fibrosis
- CIRRHOSIS: Fibrosis, Hyperplastic nodules
- HEPATITIS: Liver cell necrosis, Inflammation, Mallory bodies, Fatty change

Exposure → Abstinence → Severe exposure

Continued exposure → Repeated attacks

Arrows indicate the progression from normal liver to steatosis to cirrhosis to hepatitis due to repeated exposure or severe exposure, with abstinence as a protective factor.