Jaundice

Summary from Rosen's By Chris Chase

Epidemiology

- Jaundice is a manifestation of elevated serum bilirubin and requires an understanding of normal metabolism for evaluation and management.

Pathophysiology

- Bilirubin is generated from heme products. Heme is oxidized to biliverdin, converted to bilirubin. It forms tight, reversible bonds with albumin and is taken up by hepatocytes where it undergoes glucuronidation, Conjugated fraction secreted into biliary system, emptied in gut and metabolized into urobilinogen and stercobilin.
- Urobilinogen reabsorbed and excreted in urine, while stercobilin is excreted in stool.
- Remaining conjugated bilirubin deconjugated and reenters portal circulation where it's taken back up by hepatocytes (enterohepatic circulation).
- Clinical jaundice not evident until total serum bilirubin concentration > 2.5 mg/dL and observed in albumin-rich tissues.
- Physiology altered in three areas: 1. Overproduction of heme products (hemolysis) 2. Hepatocellular dysfunction 3. Obstruction of biliary excretion into intestine

Differential Diagnosis

- **Critical**
  - Fulminant hepatic failure
  - Hepatic toxin
  - Virus
  - Alcohol
  - Hepatic ischemic insult
  - Reye's syndrome
  - Cholangitis
  - Sepsis
  - Heatstroke
  - Obstructing AAA
  - Budd-Chiari syndrome
  - Severe CHF
  - Transfusion reaction
  - Preeclampsia/HEELP syndrome
  - Acute fatty liver of pregnancy
- **Nonemergent**
  - Hepatitis with normal mental status and VS, and no active bleeding
  - Post-traumatic hematoma resorption
  - TPN
  - Gilbert's syndrome
  - Physiologic neonatal jaundice
  - Cholestasis of pregnancy
- **Emergent**
  - Hepatitis of any cause with confusion, bleeding, coagulopathy
  - Wilson's disease
  - Autoimmune hepatitis
  - Liver transplant rejection
  - Infiltrative liver disease
  - Drug induced
  - Toxin ingestion/exposure
  - Bile duct obstruction (stone, inflammation, stricture, neoplasm)
  - Sarcoidosis
  - Amyloidosis
  - Graft-versus-host disease
  - Right-sided CHF
  - Veno-occlusive disease
  - Hemolytic anemia
  - Massive malignant infiltration
  - Inborn error of metabolism
  - Pancreatic head tumor
  - Metastatic disease
  - Hyperemesis gravidarum

Signs and Symptoms

- Patients may be asymptomatic or have nonspecific symptoms: pruritus, malaise, or nausea.
- Jaundice with abdominal pain suggests biliary obstruction or significant hepatic inflammation. New-onset painless jaundice

- Personality changes or confusion may suggest hepatic encephalopathy.
- Jaundice first apparent sublingually, in conjunctiva and on hard palate (Cephalocaudal progression). Cutaneous findings of liver disease may be present (angiomas, caput medusa, excoriations from pruritus).
- Abdominal exam can reveal distension, indicating presence of ascites. Enlarged, tender liver-hepatic inflammation or engorgement due to biliary obstruction. Enlarged, non-tender liver-malignant infiltration. Nonpalpable liver-fibrosis due to cirrhosis. Splenomegaly-hemolysis, malignancy or portal hypertension.
- Neurologic evaluation may show signs of hepatic encephalopathy: depressed mental status, confusion, asterixis (specific in HE)

Work-up

- Begin with a thorough history with emphasis on: liver disease, viral prodrome, alcohol/IVDU, biliary tract surgery, fever, abdominal pain, pregnancy, toxic ingestion, malignancy, recent blood products, occupational exposure, recent trauma, and cardiovascular disease.
- Physical exam with emphasis on abdominal, skin and neurologic exams.
- Laboratory tests: CBC with platelets, PT/PTT, Hepatic panel: transaminases, alkaline phosphatase, bilirubin with fractionation, amylase, ABG, alcohol /acetaminophen level, Hep panel, pregnancy test. Serum ammonium and glucose checked with patients with AMS. If ascites present and suspect SBP, paracentesis is diagnostic.
- Abdominal imaging helpful if obstruction is suspected. Ultrasound best screen with high likelihood of biliary disease and benign obstruction. CT is preferred if entire abdomen needs to be evaluated or high likelihood of malignancy.
- Indirect bilirubinemia points to a hematologic cause, whereas direct bilirubinemia indicates hepatobiliary pathology.
- Elevated AP parallel to transaminases with direct bilirubinemia->**Obstructive process**
- Highly elevated transaminases with normal to mild increase in AP->**Hepatocellular/cholestatic**

Empiric Management

- Specific therapies depend on the presumptive cause of the jaundice.
- Supportive therapy with IV fluids, analgesics, antiemetics.
- Remove hepatotoxic drugs and treat for acetaminophen toxicity with NAC therapy if indicated. Evaluate and treat hepatic encephalopathy.
- If hemolytic cause, consider transfusion based on patient's ability to oxygenate. Urgent hematology consult.
- SBP treated empirically with a 3rd generation cephalosporin.
- Pregnant women with jaundice should be treated in conjunction with obstetric and GI specialist. IV hydration for hyperemesis gravidarum. Ursodeoxycholic acid for pruritus in intrahepatic cholestasis of pregnancy. Acute fatty liver will require prompt delivery.

Disposition

- In absence of liver failure, patients with encephalopathy or unstable vital signs should be admitted. Hospitalize patients with new-onset jaundice if transaminases >1000 IU/L, bilirubin >10mg/dL or evidence of coagulopathy.
- Patients with hepatitis or cholestatic jaundice managed as outpatient if normal mental status, stable vital signs, ability to take oral fluids and no evidence of active bleeding/coagulopathy or complicating infectious process.
- Patients with extrahepatic obstructive jaundice admitted for drainage with ERCP.
- Consultation with surgery, GI, hematology, OB as indicated by cause of jaundice.
- Fulminate hepatic failure patients should be admitted to ICU.