Acute and Chronic Viral Hepatitis

Hepatitis is an inflammation of the liver that can be caused by viruses, drugs/toxins, and autoimmune diseases. Viral hepatitides are important causes of perioperative hepatic dysfunction.

ANESTHETIC CONSIDERATIONS:

- Maintain hepatic perfusion in the perioperative period and to avoid any hepatotoxic drugs or significant hypotension that might precipitate liver failure or hepatic encephalopathy.

ANESTHETIC GOALS:

- With chronic hepatitis, prevention of acute liver failure or further hepatic deterioration
- To identify perioperative risks and direct therapy to minimize hepatotoxicity and maximize hepatic oxygen delivery

HISTORY & PHYSICAL

ACUTE HEPATITIS:

- Signs and symptoms:
  - All five types of viral hepatitis have similar clinical features
  - Patients may remain asymptomatic, develop influenza-like symptoms, become jaundiced, or develop acute hepatic failure
  - Typical initial symptoms: dark urine, fatigue, anorexia, nausea, vomiting, low-grade fever, headache, RUQ abdominal pain/discomfort, myalgias, arthralgias
  - Many of the initial symptoms abate when jaundice develops
  - Hepatomegaly, splenomegaly
  - If severe, signs of acute liver failure may be present (confusion, asterixis, peripheral edema, ascites)
- Clinical course:
  - Typically the clinical course is uneventful and the return to normal liver function is complete
  - Rarely acute viral hepatitis results in fulminant liver failure and death
  - Some patients never recover from the initial acute viral infection and chronic hepatitis develops (does not occur after HAV or HEV, but in 2-7% of HBV and 60-75% of HCV infected patients)

CHRONIC HEPATITIS:

- Disease that has lasted 6 months or longer
- Signs and symptoms:
  - Most common symptoms are fatigue, malaise, and abdominal pain
  - Extrahepatic manifestations are common and include arthralgias, arthritis, glomerulonephritis, skin rashes, amenorrhea, and thyroiditis
  - Signs of liver failure with chronic hepatitis include: scleral icterus, jaundice, ascites, splenomegaly, palmar erythema, gynecomastia, asterixis, testicular atrophy, spider angiomata, petechiae, and ecchymosis
  - The liver may be enlarged or small, hard and cirrhotic
- Clinical course:
  - Chronic hepatitis refers to a group of liver disorders of varying etiologies and severity in which hepatic inflammation and necrosis continue for at least 6 months
  - Persistent HBV infection is an important risk factor for development of hepatocellular carcinoma
  - The natural history of chronic hepatitis C may span several decades, progressing insidiously with the ultimate development of cirrhosis or hepatocellular cancer after 10 to 20 years
    - Factors associated with a more rapid rate of progression to cirrhosis include age older than 40 years at the time of initial infection, significant daily alcohol consumption, male gender, and co-infection with other hepatic viruses or human immunodeficiency virus

INVESTIGATIONS

- The diagnostic laboratory abnormality of acute hepatitis is a markedly increased aminotransferase level
  - AST and ALT concentration increase 7-14 days before the appearance of jaundice and begin to decrease shortly after jaundice develops
  - The degree of aminotransferase increase does not necessarily parallel the severity of the hepatitis, but concentrations <500 IU/L usually reflect mild hepatitis
  - Hepatitis E: anti-HEV antibody
  - The ALT and AST concentrations are characteristically increased in patients with chronic hepatitis, and serum bilirubin concentrations are typically normal in patients with chronic viral hepatitis
- CBC (anemia and lymphocytosis are typically present), serum bilirubin (increases for 10-14 days and then decreases during the next 14-28 days; rarely exceeds 20 mg/dL), ALP (not increased unless cholestasis develops at a later phase of acute hepatitis), albumin and INR/PTT (severe acute hepatitis may impair the snthetic capacity of the liver and result in hypoalbuminemia and/or a prolonged INR)
- Serologic Markers:
  - Hepatitis A:
    - IgM anti-HAV- appears early in the course of the disease and is specific for acute hepatitis A
    - IgG anti-HAV- replaces IgM after 120 days
  - Hepatitis B:
    - Hepatitis B surface antigen (HBsAg)- present in the serum as early as 7-14 days after infection and may persist for several months; detection indicates that HBV is actively replicating and that the blood of these individuals is infectious
    - Antibody to HBsAg- usually appears in the blood 60-240 days after infection by which time the surface antigen is undetectable; the Ab is a long-lasting antibody and is associated with immunity
    - Hepatitis Be antigen (HbeAg)- follows the pattern of HbsAg, and recovery is heralded by the disappearance of this antigen, while persistence of HbeAg identifies patients whose blood remains infective
    - The antibody to the core antigen of HBV (IgM anti-Hbc)- appears promptly after infection and persists for 6 to 12 months; High titers of IgM antibody to the core antigen of HBV may be the only marker of acute hepatitis B if HBsAg is no longer detectable
    - Chronic HBV infection: HBsAg remains detectable for more than 6 months
      - HBsAg Carriers- Persons who continue to test positive for HBsAg but who are asymptomatic and have normal serum aminotransferase concentrations
      - Chronic hepatitis B- chronically infected HBsAg-positive individuals who have clinical or laboratory evidence of

chronic hepatic disease

- Hepatitis C:
  - Antibodies to HCV (anti-HCV)- most reliable way to diagnose acute and chronic hepatitis C
  - HCV RNA- confirms the presence of viremia
- Hepatitis D: anti-HDV, HBsAg, and IgM antibody to the core antigen of HBV in serum

- Liver biopsy is not often necessary to confirm the diagnosis of acute hepatitis
  - Spotty necrosis of hepatocytes and widespread parenchymal inflammation are the typical histologic findings of acute viral hepatitis; Fibrosis is absent
  - There are no reliable histologic findings that separate the five kinds of viral hepatitis from each other.

OPTIMIZATION

- Treatment of acute viral hepatitis is symptomatic
- May require iv fluids and electrolyte replacement for significant nausea and vomiting
- Retrospective data suggest that patients with acute hepatitis from any cause are at increased risk for hepatic failure and death after elective surgery. Thus, elective surgery should be delayed in these individuals until resolution of acute hepatocellular dysfunction can be confirmed.
- The decision to initiate treatment depends on balancing the patient's age, severity of disease, likelihood of response, and potential adverse effects and complications
- To date, six drugs have been approved for treatment of chronic HBV: interferon alfa-2b, lamivudine, adefovir, entecavir, pegylated interferon alfa-2a, and telbivudine
- Chronic HCV infection is usually treated with the combination of ribavirin and pegylated interferon alfa-2a

ANESTHETIC OPTIONS

- None
- Local
- Regional
- GA
- No data support the benefit or detriment of regional versus general anesthesia, nor do data suggest particular anesthetic drugs that should be administered or avoided with preexisting hepatic dysfunction, with the exception of halothane

ANESTHETIC SETUP AND MANAGEMENT OF ANESTHESIA

- See seminar on liver failure and ESLD

PATHOPHYSIOLOGY

TABLE 11–1 -- Characteristic Features of Viral Hepatitis

Parameter	Type A	Type B	Type C	Type D
Mode of transmission	Fecal-oral Sewage-contaminated shellfish	Percutaneous Sexual	Percutaneous	Percutaneous
Incubation period	20–37 days	60–110 days	35–70 days	60–110 days
Results of serum antigen and antibody tests	IgM early and IgG appears during convalescence	HBsAg and anti-HBc early and persists in carriers	Anti-HCV in 6 weeks to 9 months	Anti-HDV late and may be short-lived
Immunity	Antibodies in 45%	Antibodies in 5%–15%	Unknown	Protected if immune to type B
Course	Does not progress to chronic liver disease	Chronic liver disease develops in 1%–5% of adults and 80%–90% of children	Chronic liver disease develops up to 75%	Co-infection with type B
Prevention after exposure	Pooled γ-globulin Hepatitis A vaccine	Hepatitis B immunoglobulin Hepatitis B vaccine	? Interferon	Unknown
Mortality	< 0.2%	0.3%–1.5%	Unknown	Acute icteric hepatitis: 2%–20%

Adapted from Keefe EB: Acute hepatitis. Sci Am Med 1999;1–9.

HBc, hepatitis B core antigen; HBsAg, hepatitis B surface antigen.

- Anesthesia personnel are at risk for occupationally acquired HBV infection as a result of accidental percutaneous or mucosal contact with blood or body fluids from infected patients
  - The risk for infection after an HBV-contaminated percutaneous exposure, such as an accidental needle stick, is 37 to 62% if the source patient is HBeAg-positive and 23 to 37% if HBeAg-negative
  - HBV can be found in saliva, but the rate of transmission is significantly less after mucosal contact with infected oral secretions than after percutaneous exposures to blood
  - HBV is a hardy virus that may be infectious for at least 1 week in dried blood on environmental surfaces
- The greatest risk of occupational HCV transmission is associated with exposure to blood from an HCV-positive source, and the average rate of seroconversion after accidental percutaneous exposure is 1.8%
  - HCV has been transmitted through blood splashes to the eye and with exposure via nonintact skin
  - HCV in dried blood on environmental surfaces may remain infectious for up to 16 hours, but environmental contamination does not appear to be a common route of transmission
  - Although HCV can be found in the saliva of infected individuals, it is not believed to represent a great risk for occupational transmission
- Risk of infection with blood products: (Can J Infect Dis Med Microbiol. 2005 May–Jun; 16(3): 161–165)
  - Hepatitis B: 1/275,000 to 1/1,000,000
  - Hepatitis C: 1/3,000,000

REFERENCES

- Barash P. 371, 1255-1256, 1260, 1270
- Coexisting Chpt 11
- Miller Chpt 66