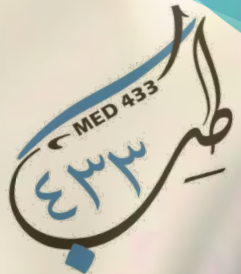


L24: Acute Viral Hepatitis



objectives

- Recognize the different type of acute viral hepatitis
- Know the possible complications and outcome of acute viral hepatitis
- Aware of the other cause of acute hepatitis in KSA
- To have fair knowledge about the latest results of epidemiological aspect of viral hepatitis A,B,C IN KSA

Viral Hepatitis - Overview

Type of Hepatitis

	A	B	C	D	E
Source of virus	feces	blood/ blood-derived body fluids	blood/ blood-derived body fluids	blood/ blood-derived body fluids	feces
Route of transmission	fecal-oral	percutaneous permucosal	percutaneous permucosal	percutaneous permucosal	fecal-oral
Chronic infection	no	yes	yes	yes	no
Prevention	pre/post- exposure immunization	pre/post- exposure immunization	blood donor screening; risk behavior modification	pre/post- exposure immunization; risk behavior modification	ensure safe drinking water

Viral Hepatitis

(general characteristics)

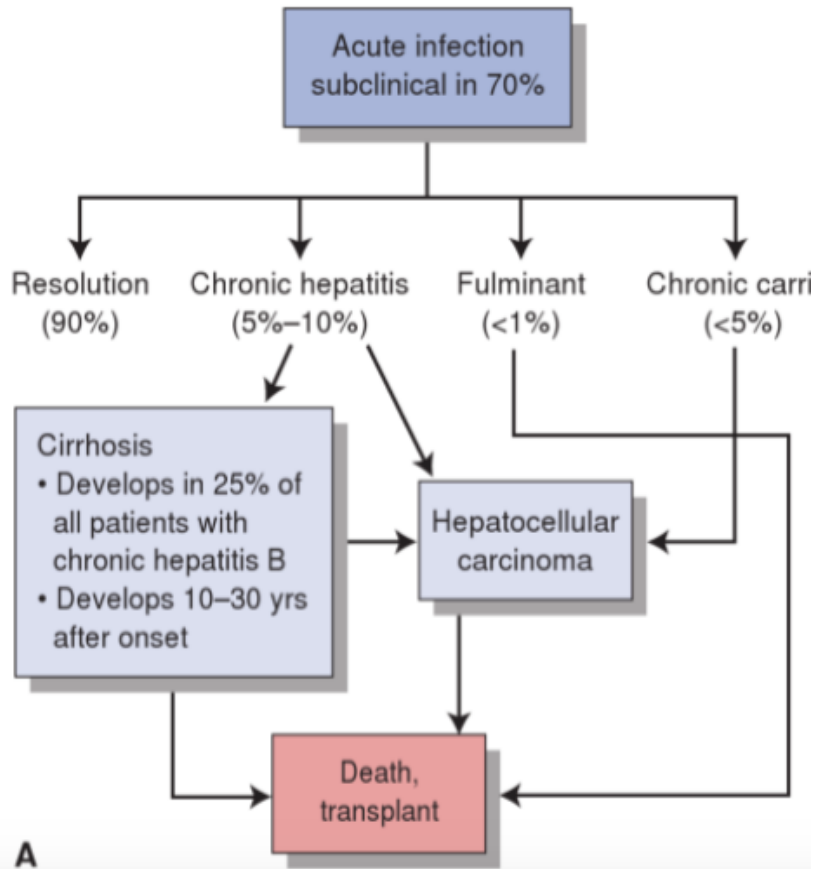
1. Hepatitis simply means inflammation of the liver. There are many noninfectious types of hepatitis, such as alcoholic hepatitis, drug-induced hepatitis, and autoimmune hepatitis, and numerous hereditary diseases that can cause hepatitis.
2. **Causes of viral hepatitis:**
 - a. There are five well understood, main categories of viral hepatitis: hepatitis A, B, C, D, and E. Hepatitis viruses are often abbreviated by their type (i.e. HAV, HBV and, so forth)
 - b. Other viruses that can cause one form or another of hepatitis are *EBV*, *CVM*, and *HSV*. These are not commonly associated with hepatitis in immunocompetent patients.
3. **Hepatitis B, C, and D** are the types that can **progress to chronic disease**.

Transmission

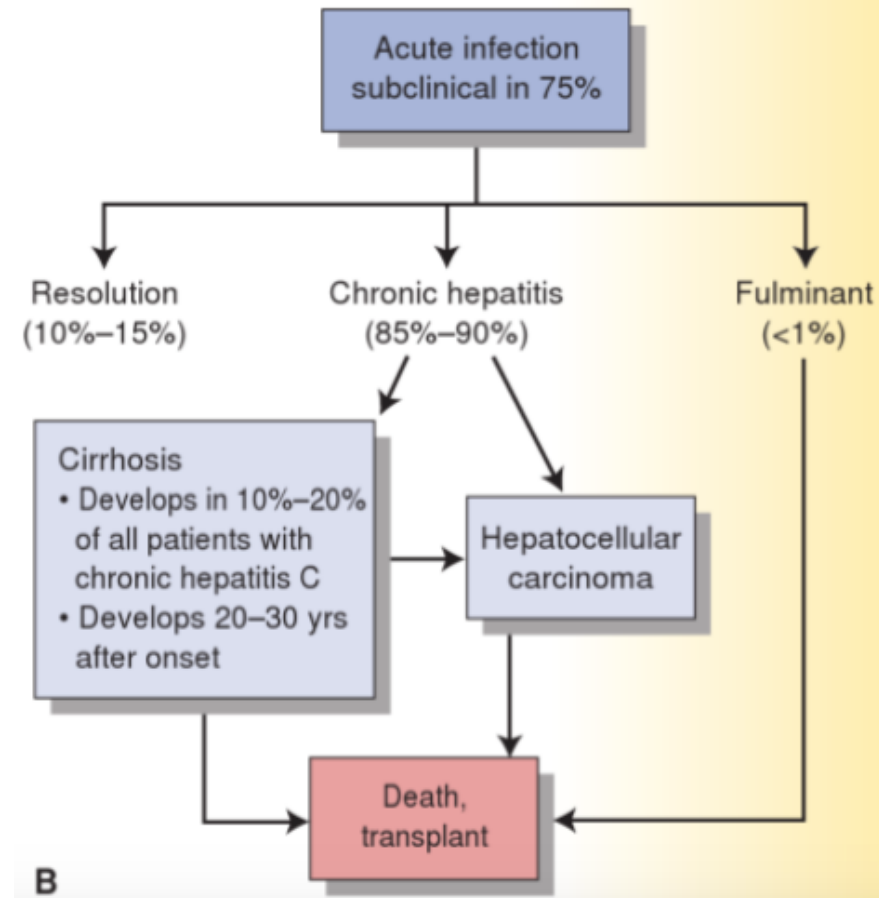
- A. Hepatitis A and E are transmitted via the fecal-oral route and are more prevalent in developing countries.
- B. Hepatitis E is particularly prevalent in India, Pakistan, southeast Asia, and parts of Africa.
- C. Hepatitis B is transmitted **parenterally or sexually**. **Perinatal** transmission is also possible and is a significant health issue in parts of Africa and Asia.
- D. Hepatitis D requires the outer envelope of the HBsAg for replication and therefore can be transmitted only as a coinfection with HBV, or as a superinfection in a chronic HBV carrier.
- E. The main route of transmission for hepatitis C is **parenteral**, and it is therefore more prevalent in **IV drug users**. Sexual or perinatal transmission is not common.

Courses of hepatitis B and C

B



C



! Hepatitis B is associated with [polyarteritis nodosa \(PAN\)](#).
Hepatitis C is associated with [cryoglobulinemia](#).

Symptoms and Signs

Pre-icteric phase	Icteric phase	Post-icteric phase
<ol style="list-style-type: none">1. Anorexia2. Fatigue3. Nausea4. Vomiting5. Arthralgia6. Myalgia7. Headache8. Photophobia9. Pharyngitis	<ol style="list-style-type: none">1. Enlarged liver2. Tender upper quadrant3. Discomfort4. Splenomegaly (10-20%)5. General adenopathy	



Lab Findings:

1. LFT increase >5-10 times of normal.
2. Markers of hepatitis B or C or A might be positive.

Clinical Features

- Classified as **acute** (<6 months of liver inflammation) **or chronic** (>6 months of persistent liver inflammation)
- Acute hepatitis has a wide spectrum of clinical presentations, ranging from virtually asymptomatic to fulminant liver failure.
- General clinical features:
 - A. **Jaundice**—Look first in the sclera, because this may be the first place jaundice can be detected, especially in black people.
 - B. Dark-colored urine may be present (due to **conjugated hyperbilirubinemia**).
 - C. RUQ pain(**right upper quadrant**).
 - D. Nausea and vomiting.
 - E. Fever and malaise.
 - F. Hepatomegaly may be present.



Generally, **HAV** and **HEV** cause a **more mild** form of hepatitis and do not become chronic.

Clinical Features (cont)

- In severe cases, acute hepatitis may result in liver failure and its complications. This is known as fulminant hepatitis (uncommon) and may be life-threatening. It occurs more commonly in hepatitis B, D, and E than in other types.

Complications includes:

- Hepatic encephalopathy—Look for **asterixis**¹ and **palmar erythema**.
 - Hepatorenal syndrome : ¹Flapping tremor—liver flap
 - Bleeding diathesis—This occurs only when liver function is very compromised.
- sometimes acute hepatitis may only present with transient flu-like symptoms such as fever, myalgias, and malaise.
 - Acute HBV may also present with a serum sickness-like illness.
 - Hepatitis C typically does not cause significant

acute illness

if **transaminases**), 500 are markedly elevated (> think of **acute viral hepatitis**-, shock liver, or drug induced hepatitis



1% of acute viral hepatitis patients will develop fulminant hepatitis which is a serious condition because the mortality is 50% in those who develop fulminant hepatitis. So we tell the patient with acute viral hepatitis if he noticed the symptoms of encephalopathy (like tremor, Disorientation, confusion and Slurred speech) to come immediately and we will admit him in the ICU.

23.38 Features of the main hepatitis viruses

	Hepatitis A	Hepatitis B	Hepatitis C	Hepatitis D	Hepatitis E
Virus					
Group	Enterovirus	Hepadna virus	Flavivirus	Incomplete virus	Calicivirus
Nucleic acid	RNA	DNA	RNA	RNA	RNA
Size (diameter)	27 nm	42 nm	30–38 nm	35 nm	27 nm
Incubation (wks)	2–4	4–20	2–26	6–9	3–8
Spread					
Faeces	Yes	No	No	No	Yes
Blood	Uncommon	Yes	Yes	Yes	No
Saliva	Yes	Yes	Yes	Unknown	Unknown
Sexual	Uncommon	Yes	Uncommon	Yes	Unknown
Vertical	No	Yes	Uncommon	Yes	No
Chronic infection	No	Yes	Yes	Yes	No (rarely in immune-compromised)
Prevention					
Active	Vaccine	Vaccine	No	Prevented by hepatitis B vaccination	No
Passive	Immune serum globulin	Hyperimmune serum globulin	No		No

Note All body fluids are potentially infectious, although some (e.g. urine) are less infectious than others.

**HBV:**

- Chronic hepatitis B infection is defined by the presence of HBV-DNA or HBsAg in the blood for > 6 months.
- HBsAg may persist in the blood for life or may disappear . After disappearance of HBsAg, anti-HBs Ab appears and persists for several years (immunity).
- Anti-HBc Ab is the 1st antibody (but not first marker) that appears in the blood and usually persists for several years.

HCV :

- About 25% of infected patients spontaneously clear HCV virus within 6 months of infection without any treatment. The remaining 75% of patients will develop chronic HCV infection.
- PCR tests detect HCV RNA in the blood, which indicates current active infection. This test is sensitive.

HEV:

- Hepatitis E viral hepatitis is always acute and usually self-limiting. However, pregnant may develop fulminant hepatitis because of HEV.



Diagnosis

- 1- Serum serology—The presence of **serum antigens** and **immunoglobulins** is the most important factor for diagnosing viral hepatitis. These are helpful for determining the acuity or chronicity of illness as well as adequate immunity.
- 2- PCR is used to detect viral RNA to **diagnose HCV**.
- 3- LFTs—Elevation of serum transaminases is not diagnostic, but LFTs are helpful.
 - a.**) for all forms of viral ²) is typically elevated more than AST (SGOT¹ALT (SGPT hepatitis (the opposite of alcoholic hepatitis).
 - b.** In acute hepatitis, ALT is usually >-. It is generally not as high as in drug-induced hepatitis



: ¹ serum glutamic-pyruvic transaminase

: ² serum glutamic oxaloacetic transaminase

Hepatitis Serology

Very important for diagnosis

Hepatitis A

- Hepatitis A antibody (anti-HAV)
 - Anti-HAV is detectable during acute infection and persists for life, so its presence does not distinguish between active disease and immunity. IgM-specific antibody denotes acute infection.

Hepatitis B

- Hepatitis B surface antigen (HB_sAg)
 - Present in acute or chronic infection +carrier
 - Detectable as early as 1 to 2 weeks after infection
 - It persists in chronic hepatitis regardless of whether symptoms are present. If virus is cleared, then HB_sAg is undetectable.
- Hepatitis B e antigen (HB_eAg)
 - Reflects active viral replication, and presence indicates infectivity
 - Appears shortly after HB_sAg
- Anti-HB_sAg antibody (anti-HBs)
 - Present after vaccination or after clearance of HB_sAg—usually detectable 1 to 3 months after infection
 - In most cases, presence of anti-HBs indicates immunity to HBV
- Hepatitis B core antibody (anti-HBc)
 - Assay of IgM and IgG combined
 - Useful because it may be the only serological marker of HBV infection during the “window period” in which HB_sAg is disappearing, but anti-HB_sAg is not yet detectable
 - Does not distinguish between acute and chronic infection, and presence does not indicate immunity
- Viral load
 - HBV DNA measured by PCR; if it persists for more than 6 weeks, patient is likely to develop chronic disease

Hepatitis C

- Hepatitis C antibody
 - Key marker of HCV infection
 - Sometimes not detectable until months after infection, so its absence does not rule out infection
- Viral load: HCV RNA measured by PCR
 - Detectable 1 to 2 weeks after infection—more sensitive than HCV antibody

Hepatitis D

- Hepatitis D antibody (anti-HDV)
 - Presence indicates HDV superinfection
 - The antibody may not be present in acute illness, so repeat testing may be necessary.

Markers

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Hepatitis B			Hepatitis C	Hepatitis A	Hepatitis E
Anti-HBc	→	exposure (IgM = acute)	Anti-HCV PCR-RNA HCV	HAV igM	HEV igM
HBsAg	→	infection (carrier)			HEV igG
Anti-HBs	→	immunity			HEV RNA PCR
HBeAg	→	viral replication		HAV igG	
anti-HBe	→	sero- conversion			
HBV-DNA	→	viral replication			

Markers Autoimmune Hepatitis

- (Anti-nuclear antibody) ANA
- Anti Mitochondrial AB
- Anti smooth muscle ABS

Treatment

- Active (vaccine) and passive (immunoglobulin) immunization are available for both hepatitis A and B. It is the standard of care for infants and health care workers to be vaccinated for HBV.
- Travelers often receive vaccinations for HAV. Passive immunization can be given for people who are exposed to the virus.
- Treatment for hepatitis A and E is **supportive**.

Complications

1. **Chronic hepatitis** → cirrhosis- HCC


2. **Fulminant hepatitis**



Prevention Of HCV Transmission

- Avoiding shared use of Razors or brushes and any item that pierces the skin
- Strict adherence of the universal precautions in health facilities.
- Educating and training of HCW's to the proper use of standard precautions
- Folk medicine?!

Preventing Hepatitis A

- Hygiene (e.g., hand washing)
 - Sanitation (e.g., clean water sources)
 - Hepatitis A vaccine (pre-exposure)
 - Immune globulin (pre- and post exposure)
- 

MCQs

1- A 70-year-old male presents with a complaint of fatigue. There is no history of alcohol abuse or liver disease; the patient is on no medication. Scleral icterus is noted on physical exam. There is no evidence for chronic liver disease on physical exam, and the liver and spleen are nonpalpable. The patient is noted to have a normocytic, normochromic anemia. The first step in evaluation of this patient would be :

- A. CT scan of the abdomen.
- B. Hepatitis profile.
- C. Liver function tests, including direct versus indirect bilirubin and urine bilirubin.
- D. Abdominal ultrasound.

2- The patient above is noted to have conjugated hyperbilirubinemia, with bilirubin detected in the urine. Serum bilirubin 12 mg/dL, AST and ALT in normal range, and alkaline phosphatase 300 U/L. The next step in evaluation would be

- A. Ultrasound or CT scan
- B. Hepatitis profile
- C. Reticulocyte count
- D. Family history for hemochromatosis

MCQs

3- A nursing student has just completed her hepatitis B vaccine series. On reviewing her laboratory studies and assuming she has no prior exposure to hepatitis B, you would expect:

- A. Positive test for hepatitis B surface antigen
- B. Antibody against hepatitis B surface antigen (anti-HBs) alone
- C. Antibody against hepatitis core antigen (anti-HBc)
- D. Antibody against both surface and core antigen
- E. Antibody against hepatitis E antigen



Answers : 1-C 2-A 3-B



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Medicine is a science of uncertainty and an art of probability



MEDICINE 433