

Editorial

Viral Hepatitis – Major Public Health Problem in Pakistan

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Hepatitis is defined as inflammation of the liver that can result from a variety of causes, such as heavy alcohol use, autoimmune disorders, drugs, or toxins. However, the most frequent cause of hepatitis is due to a viral infection, referred to as "viral hepatitis." In the United States, the most common types of viral hepatitis are hepatitis A, hepatitis B, and hepatitis C. The other types of viral hepatitis are hepatitis D and E, which are less frequently encountered.¹

Hepatitis can be further classified into "acute" and "chronic" based on the duration of the inflammation in the liver. Inflammation lasting less than 6 months is defined as "acute," and inflammation lasting greater than 6 months is defined as "chronic." Although acute hepatitis is usually self-limiting, it may also cause fulminant liver failure, depending on the etiology. In contrast, chronic hepatitis may result in the development of liver fibrosis, cirrhosis, hepatocellular carcinoma, and features of portal hypertension, leading to significant morbidity and mortality.^{2,3}

Etiology:

The majority of cases of viral hepatitis result from hepatotropic viruses A, B, C, D, and E. It is unclear whether the hepatitis G virus (HGV) is pathogenic in humans.

Hepatitis A

The hepatitis A virus (HAV) is an RNA virus from the Picornaviridae family. It is usually present in the highest concentration in the stool of infected individuals.

The most common mode of transmission of hepatitis A is via the fecal-oral route from contact with food, water, or objects contaminated by fecal matter from an infected individual.⁴

Hepatitis B

Hepatitis B virus (HBV) is a DNA virus and a member of the Hepadnaviridae family. HBV can be detected in serum, semen, vaginal mucus, saliva, and tears, even at a lower level but is not found in stool, urine, or sweat. It is transmitted parenterally and sexually when individuals come in contact with mucous membranes or body fluids of infected individuals. Intravenous drug users, men who have sex with men, healthcare workers with exposure to infected body fluids.

Transfusion of blood and blood products, injection drug use with shared needles, needle sticks, or skin penetrating wounds caused by other instruments used by healthcare workers, and hemodialysis.⁵

Hepatitis C

Hepatitis C virus (HCV) is an RNA virus and is a member of the Flaviviridae family with 1 serotype but

at least 6 major genotypes and more than 80 subtypes. Transmission can be parenteral, perinatal, and sexual. Others who are susceptible are those who require frequent blood transfusions and transplantation of organs from infected donors. Sexual and perinatal transmission is not very common.⁶

Hepatitis D

The hepatitis D virus (HDV) is an RNA virus and a single species in the Deltaviridae family. HDV has modes of transmission similar to HBV, but perinatal transmission is uncommon.⁷

Hepatitis E

The hepatitis E virus (HEV) is a non-enveloped RNA virus and a single species in the Calciviridae family of the Herpesvirus genus. The primary transmission mode of the HEV is the fecal-oral route. Contaminated water is the most common source of infection. Person-to-person transmission is rare. However, occasionally, maternal-neonatal transmission can occur.⁸

Hepatitis G-Human Pegivirus

Hepatitis G virus ((HGV), now designated human pegivirus (HPgV-1), is an RNA virus and is a member of the Flaviviridae family. The primary mode of transmission is through infected blood and blood products, but sexual contact and vertical transmission occur as well.⁹

Epidemiology

Viral hepatitis is a major public health issue. Viral hepatitis infects millions of people annually, causing significant morbidity and mortality. Chronic hepatitis B and C infections can cause liver damage that includes liver fibrosis, cirrhosis, hepatocellular carcinoma, and features of portal hypertension. The World Health Organization (WHO) estimated that 1.3 million people died due to hepatitis in 2015, and 1 in 3 people in the world have had infections with either HBV or HCV. Viral hepatitis can cause up to 1.4 million deaths annually, and HBV and HCV are responsible for about 90% of those deaths. Reportedly, infection rates show that 2 billion people are infected with HBV, 185 million with HCV, and 20 million with HEV worldwide.^{10,11,12}

Latest Research on Viral Hepatitis in Pakistan

According to latest research on viral hepatitis, Pakistan faces a massive, escalating burden of viral hepatitis, with 10–12 million people living with hepatitis B or C (HBV/HCV). Recent 2024–2025 research indicates a 4.8%–5% prevalence of HCV, particularly in Balochistan (25.77%), driven by unsafe healthcare practices and a low treatment rate (3% for HBV, 2% for HCV).

Research highlights HCV is dominant, affecting 9.3 million, with high risk in rural areas (67%) and housewives (37%). Primary drivers include unsafe dental procedures, blood transfusions, and unsafe therapeutic injections.

According to Provincial Breakdown (HCV) Global report varying prevalence: Baluchistan (25.77%), KPK (6.07%), Punjab (5.46%), and Sindh (2.55%).

Pakistan Tops World in Hepatitis C infections

An alarming report from the World Health Organisation (WHO) indicates that Pakistan had the highest number of viral hepatitis C infections in the world, around 8.8 million, and accounts for 44 per cent of all new hepatitis C infections attributed to unsafe medical injections.

In previous years, Egypt reported the largest number of hepatitis C and B cases, followed by Pakistan.

The data from 187 countries shows the estimated number of deaths from viral hepatitis increased from 1.1 million in 2019 to 1.3 million in 2022. Of these,

83pc were caused by hepatitis B and 17pc by hepatitis C, according to the report.

If the number of hepatitis B and hepatitis C cases are combined, then Pakistan ranks fifth in the world, only trailing behind China, India, Indonesia and Nigeria, with around 12.6 million cases reported in 2022.

The WHO’s Global Hepatitis Report 2024 notes that ten countries account for nearly two thirds of the global burden of viral hepatitis B and C, with Ethiopia, Bangladesh, Vietnam, Philippines and the Russian Federation rounding off the top ten.

For hepatitis C, six countries — China, India, Indonesia, Pakistan, Russian Federation and US — represent 50% of the global burden. However, the report states that Egypt has become the first country to achieve gold tier status on the path to elimination of hepatitis C, based on fulfilling WHO criteria that will set the country up to achieve the reduced incidence.

WHO aims for a 90% reduction in new chronic infection and 65% reduction in mortality in 2023. As of 2025, WHO reports approximately 304 million people are living with chronic hepatitis B and C.

Countries that represent two-thirds of the global burden of hepatitis B and C combined in 2022

Country	Total hepatitis B infections	Total hepatitis C infections	Total hepatitis B+C infections
China	79,700,000	4,000,000	83,800,000
India	29,800,000	5,500,000	35,300,000
Indonesia	17,500,000	1,400,000	18,900,000
Nigeria	14,400,000	1,350,000	15,700,000
Pakistan	3,800,000	8,800,000	12,600,000
Ethiopia	7,700,000	692,000	8,400,000
Bangladesh	7,200,000	1,020,000	8,300,000
Vietnam	6,500,000	900,000	7,400,000
Philippines	5,700,000	400,000	6,100,000
Russia	1,700,000	2,700,000	4,300,000

Source: Global Hepatitis Reporting System, WHO

Pathophysiology

The pathophysiology of viral hepatitis varies with the type of hepatitis pathogen.

Types of Hepatitis

	TRANSMISSION	PREVENTION	TREATMENT
Hepatitis A	Eating contaminated food or drinking contaminated water	<ul style="list-style-type: none"> Practicing good hygiene Vaccine 	No treatment
Hepatitis B	Through contact with the blood or bodily fluids of an infected person	<ul style="list-style-type: none"> Practicing good hygiene Vaccine Blood screening 	<ul style="list-style-type: none"> Alpha interferon Peginterferon
Hepatitis C	Blood-to-blood contact	<ul style="list-style-type: none"> Practicing good hygiene Avoid sharing needles, toothbrushes, razors or nail scissors 	Direct-acting antiviral drugs
Hepatitis D	Contact with infected blood (only occurs in people already infected with hepatitis B)	<ul style="list-style-type: none"> Hepatitis B vaccine Avoid sharing needles, toothbrushes, razors or nail scissors 	Interferon
Hepatitis E	Eating contaminated food or drinking contaminated water	<ul style="list-style-type: none"> Practicing good hygiene Avoid drinking water that has come from a potentially unsafe source 	No treatment

Types of Hepatitis (A, B, C, D, E)

Hepatitis A (HAV)¹³

Nature: Acute only (does not become chronic)

Transmission: Focal-oral route (contaminated food, water, poor hygiene).

Risk Groups: Travelers, people in crowded settings, areas with poor sanitation

Symptoms: Flu-like illness, jaundice, nausea, abdominal pain.

Diagnosis: Anti-HAV IgM indicates active infection, IgG indicates past infection and immunity.

Treatment: Supportive therapy with rest, hydration, and nutrition.

Vaccine: Available and effective in prevention.

Hepatitis B (HBV)¹⁴

Nature: Both acute and chronic

Transmission: Blood and body fluids (unprotected sex, IV drug use, transfusion, childbirth).

Risk Groups: Healthcare workers, IV drug users, newborns of infected mothers.

Symptoms: GI upset, jaundice, dark urine, fatigue

Diagnosis: HBsAg indicates active infection; Anti-HBs shows recovery or immunity

Treatment:

- Acute: supportive care
- Chronic: Antiviral therapy (entecavir, tenofovir) to suppress viral replication

Vaccine: Safe and effective HBV vaccine prevents infection.

Hepatitis C (HCV)¹⁵

Nature: Both acute and chronic; most infections become chronic

Transmission: Blood borne (IV drug use is the most common route)

Symptoms: Often asymptomatic in early stages; may progress to chronic liver disease

Diagnosis: Anti-HCV antibodies and HCV RNA detection

Treatment: Direct-acting antivirals (DAAs) provide >95% cure rates

Vaccine: None available

Hepatitis D (HDV)¹⁶

Nature: Requires hepatitis B for replication (cannot exit alone)

Transmission: Blood and body fluids, similar to HBV

Complications: Superinfection with HBV worsens prognosis, leading to fulminant hepatitis and cirrhosis

Diagnosis: Detection of HDV antigen or anti-HDV antibodies

Treatment: Limited options; interferon-based therapies may be used

Vaccine: No direct vaccine, but HBV vaccination prevents HDV infection

Hepatitis E (HEV)¹⁷

Nature: Acute only (usually self-limiting)

Transmission: Fecal-oral route (contaminated food, water, undercooked meats)

Risk Groups: Endemic in developing countries; severe in pregnant women

Symptoms: Similar to HAV, with additional risk of fulminant hepatitis in pregnancy

Diagnosis: Detection of anti-HEV antibodies

Treatment: Supportive care (rest, hydration, nutrition)

Vaccine: Limited availability; not widely used

Human Pegivirus

The incubation period of human pegivirus (HPgV-1) is approximately 14 to 20 days.¹⁸

Common Signs and Symptoms of Hepatitis

While symptoms vary across types, common clinical features include:

- Gastrointestinal upset (nausea, vomiting, abdominal pain, anorexia).
- Jaundice (yellowing of skin and eyes)
- Dark urine
- Clay-colored stool
- Fatigue and malaise
- Flu-like symptoms

Diagnostic Investigations

Diagnostic tools vary by hepatitis type but commonly include:

Test	Interpretation
Liver Enzymes (ALT, AST)	Elevated in all types of hepatitis
Bilirubin	Increased in jaundice
Ammonia	Elevated in advanced cases (hepatic encephalopathy)
Anti-HAV IgM/IgG	Distinguishes active vs past HAV infection
HBsAg, Anti-HBs	Indicates HBV infection status and immunity
Anti-HCV, HCV RNA	Confirms HCV infection
HDAg, Anti-HDV	Identifies HDV infection
Anti-HEV	Indicates HEV infection

Treatment / Management

The general management of acute viral hepatitis is supportive, and most individuals can be safely monitored in the outpatient setting. The infection is usually self-limited in most cases. Efforts should be made to prevent disease transmission to those in close contact with the patient.

Treatment Approaches

Supportive Therapy: Rest, hydration, and nutritional support in acute hepatitis (A &E, and mild cases of B).

- Antivirals: Chronic HBV and HCV infections are treated with antiviral agents to suppress viral replication and prevent progression.
- Interferon Therapy: Occasionally used in chronic HCV and HDV infections
- Liver Transplant: In cases of end-stage liver disease or liver failure due to hepatitis

Prevention and Vaccination

- **HAV Vaccine:** Effective and recommended, especially for travelers and high-risk groups
- **HBV Vaccine:** Universal vaccination protects against both HBV and HDV
- **HCV Vaccine:** Not available, preventive strategies rely on avoiding exposure
- **HEV Vaccine:** Available in limited regions, not widely accessible

Preventive measures include:

- Practicing good hand hygiene
- Avoiding unprotected sex with infected partners
- Avoiding sharing of needles or personal hygiene products
- Consuming safe, clean food and water
- Limiting alcohol and hepatotoxic medications

Patient Education for Hepatitis

Patients should be educated on:

- Rest and proper nutrition with small frequent meals
- Diet modifications: low fat and protein, high carbohydrates and calories
- Avoidance of alcohol, acetaminophen, and other hepatotoxic drugs
- Safe practices to prevent transmission (no sharing personal items, safe sex)
- Avoiding sexual activity until hepatitis antibodies are negative

Complications of Hepatitis

If left untreated, hepatitis can lead to

- Acute liver failure
- Chronic hepatitis (B, C, D)
- Cirrhosis and portal hypertension
- Hepatocellular carcinoma
- Fulminant hepatitis (especially in HEV during pregnancy)

Differential Diagnosis

The differential diagnoses for viral hepatitis are as follows:

1. Liver abscess
2. Hepatocellular cancer
3. Pancreatic cancer
4. Drug-induced hepatitis
5. Autoimmune hepatitis
6. Acute cholangitis
7. Acute cholecystitis and biliary colic
8. Pancreatitis
9. Gastroenteritis
10. Cholelithiasis
11. Peptic ulcer disease
12. Small-bowel obstruction

Prognosis

The prognosis of viral hepatitis depends on the type of virus causing the infection.

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