

A MINI REVIEW ON PREVALENCE, PATHOGENESIS, TRANSMISSION, MORTALITY RATE, DIAGNOSIS AND TREATMENT OF HEPATITIS

Sana Fatima*

Department of Forensic Science, The Islamia University of Bahawalpur, Punjab, Pakistan

Submitted April 27, 2024; Revised June 12, 2024; Accepted July 19, 2024; Published September 20, 2024

ABSTRACT

The many viruses that cause the most prevalent forms of viral hepatitis. Other types of hepatitis, including viral hepatitis, can be brought on by things like alcoholism, drug toxicity, autoimmune diseases, or metabolic abnormalities. Depending on the underlying etiology, the specific pathophysiology of these non-viral kinds of hepatitis can change. The hepatitis A virus (HAV) is spread by tainted food and water. A person can contract the hepatitis B virus (HBV) by encountering infected blood or other bodily fluids. Hepatitis C virus (HCV) spreads via sharing needles or other drug paraphernalia or by direct contact with blood that has been infected. It is significant to remember that there are additional, less typical causes of hepatitis. It is recommended to speak with a healthcare provider for a precise diagnosis and the best course of action about the condition of liver.

Keywords: Hepatitis, Prevalence, Transmission, Diagnosis, Treatment.

*Corresponding Author. E-mail: at7227834@gmail.com

INTRODUCTION

The term "hepatitis" is used to describe liver inflammation. Viral infections, excessive alcohol use, specific drugs, autoimmune diseases, metabolic abnormalities, and exposure to toxins are just a few of the things that might cause it. Viral hepatitis, caused by certain viruses such hepatitis A, B, C, D, and E, is the most prevalent type of hepatitis. Infected people can spread hepatitis A (HAV) through tainted food, water, or personal contact. It usually manifests as an acute infection with symptoms like fatigue, nausea, vomiting, discomfort in the abdomen, appetite loss, jaundice, and black urine [1]. Hepatitis A is typically treated successfully

and without problems. It is possible to contract hepatitis B (HBV) through coming into touch with infected blood, sperm, or other bodily fluids. It could be acute or ongoing. Acute infections might be asymptomatic or show symptoms like the flu. Cirrhosis, liver damage, and an increased risk of liver cancer can result from chronic infection. Immunization helps protect against hepatitis B. Hepatitis C (HCV) is a contagious disease that can be spread by sexual contact, sharing needles or other drug paraphernalia, or contact with contaminated blood. Although hepatitis C infection is frequently asymptomatic, it can result in

ABOSS is published by AMMANIF Publisher. The authors retain the copyright without restriction. This article is an open access article published under the terms and conditions of [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).



cirrhosis, chronic liver disease, and liver cancer. Hepatitis C cannot be prevented, although it can be managed with antiviral drugs [2]. Hepatitis D (HDV) only affects those who have already contracted hepatitis B. Contact with contaminated blood or other bodily fluids can spread HDV. Serious acute or chronic liver disease may result from it [3, 4]. Hepatitis E virus (HEV) is primarily spread through tainted food or water, and it is more common in places with inadequate sanitation. Although it usually starts as an acute infection and goes away on its own, it can be dangerous for pregnant women and those who already have liver problems. Other types of hepatitis, other from viral hepatitis, can be brought on by drinking excessively, autoimmune illnesses, drugs, toxins, or metabolic abnormalities. Often referred to as non-viral hepatitis, these types of conditions [5].

It is vital to remember that every variety of hepatitis has unique traits, including methods of transmission, symptoms, prognoses, and available treatments. It is advisable to speak with a healthcare provider for an accurate assessment and management if you suspect you have hepatitis or have concerns about the condition of your liver [6, 7].

CAUSATIVE AGENTS

Hepatitis is the term for liver inflammation, which can be brought on by a variety of different things. Hepatitis's causative factors can be divided into numerous groups. Hepatitis viruses that cause the most prevalent forms of viral hepatitis (HAV, HBV, HCV, HDV, HEV) [8]. Hepatitis that is autoimmune in origin, is brought on when the immune system of the body unintentionally targets the liver. Hepatitis brought on by excessive alcohol use or the use of specific pharmaceuticals is a possibility. Non-alcoholic fatty liver disease is a condition marked by the accumulation of liver fat that is frequently linked to obesity, diabetes, and metabolic syndrome [9].

Medications, natural therapies, and exposure to toxins can all result in the development of hepatitis. For instance, drug-induced hepatitis can result from an overdose of acetaminophen (paracetamol).

PREVALENCE

Hepatitis viruses come in a variety of forms, including hepatitis A, B, C, D, and E. Hepatitis is more common in some places than others, depending on the type and the area.

Hepatitis A

The major way that hepatitis A is spread is through tainted food or water. Hepatitis A prevalence varies between regions of the world. Hepatitis A incidence is typically low in developed nations with strong sanitation and hygiene standards [10]. The frequency may be higher in areas with inadequate sanitation and little access to clean water, though. Hepatitis A outbreaks can happen in places with poor sanitation or in people who engage in high-risk activities, such drug users or men who have sex with males.

Hepatitis B

Contact with infected blood or other bodily fluids is the main way that hepatitis B spreads. Hepatitis B prevalence varies widely as well. Prevalence rates can reach 10% or higher in regions with significant endemicity, such as parts of sub-Saharan Africa and East Asia. The prevalence of chronic hepatitis B infection has decreased because of the effective immunization programs that have been adopted in many developed nations.

Hepatitis C

Hepatitis C is spread through coming into touch with blood that has been infected. Hepatitis C prevalence varies across the world as well. Hepatitis C is more common in some areas than others, including Egypt and parts of Central Asia. This is frequently because of outdated medical procedures that involved risky injections or tainted blood supplies. Significant advancements in the treatment and prevention of hepatitis C have

been made recently thanks to the accessibility of extremely powerful antiviral drugs [11].

Hepatitis D

It is a special type of virus that can only infect people if hepatitis B is already present. Hepatitis B prevalence in a certain group affects how common hepatitis D is in that population. Hepatitis D can be widespread in areas where hepatitis B is predominant.

Hepatitis E

Consuming tainted food or water is the main way that hepatitis E spreads. Hepatitis E is typically more prevalent in underdeveloped nations with poor sanitation systems. In areas impacted by natural catastrophes or armed conflicts, outbreaks can sometimes happen, compromising water and sanitation infrastructure.

PATHOGENESIS OF HEPATITIS

Hepatitis A

HAV is spread via the fecal-oral route, frequently because of tainted food or drink. The liver cells are infected by the virus once it enters the body through the mouth. The infection damages the liver by inflaming it. The immune system reacts by attacking the infected liver cells, which causes the typical hepatitis symptoms.

Hepatitis B

It is mainly spread via contact with infected blood, sperm, or other bodily fluids. When a virus enters the bloodstream, it moves to the liver and infects the cells there. The pathogenesis of HBV infection is significantly influenced by the immunological response. As a result of the immune system's reaction, infected liver cells are inflammatory and destroyed. However, in rare circumstances, the immune response develops into a chronic condition, leading to an ongoing infection and lifelong liver damage [12].

Hepatitis C

HCV is spread via contact with blood that has been infected. HCV infects liver cells by entering the bloodstream, much like HBV

does. The immunological response to HCV infection is frequently insufficient, which most frequently results in chronic infection. The virus causes inflammation and direct damage to liver cells, which over time progresses to liver disease.

Hepatitis D

For an individual to get HDV, HBV must also be present. Only people with HBV infection or those who get both viruses at the same time can contract it. When HDV reaches liver cells, it replicates by utilizing the HBV envelope proteins. More severe liver damage results from an HBV and HDV infection than an HBV infection alone.

Hepatitis E

HEV is typically spread by tainted food or water. Inflammation results from the virus infecting liver cells once it enters the digestive system [13]. Except in extremely rare circumstances, such as in people with compromised immune systems, HEV infection is often self-limiting and does not cause chronic hepatitis.

HEPATITIS TRANSMISSION MODES

Depending on the hepatitis virus type, hepatitis can be spread by a variety of methods. Hepatitis A, B, and C are the three primary varieties of viral hepatitis.

Hepatitis A

Fecal-oral approach Usually, the virus spreads by tainted food or drink. The transmission of HAV might be aided by inadequate personal hygiene and poor sanitation. Additionally, it can spread by close contact with an infected person.

Hepatitis B

Blood and bodily fluids: Contact with contaminated blood, semen, vaginal fluids, or other bodily fluids can result in the

transmission of HBV. Unprotected sexual contact, sharing of needles or syringes, and mother-to-child transmission after childbirth are the most typical methods of transmission. Perinatal transmission: During childbirth, an

HBV-positive mother can pass the virus to her unborn child. Occupational exposure: If the right measures are not taken, healthcare professionals or anybody who meets blood or bodily fluids run the risk of contracting HBV.

Hepatitis C
Direct blood-to-blood contact with blood that has been infected is the main way that HCV is spread. Sharing needles or other drug paraphernalia, receiving tainted blood transfusions or organ transplants (before extensive screening), or needlestick accidents among medical personnel are some ways that this can happen.

Child-to-mother transmission HCV can be passed from an infected woman to her child after childbirth, however this is less frequent than with HBV [14]. Despite the typically reduced risk compared to other methods, sexual contact can nevertheless result in the transmission of HCV, especially when high-risk sexual activities or the presence of other STDs are present. It is crucial to remember that these are merely broad means of transmission; each variety of hepatitis may also spread through other, less prevalent means. The risk of transmission can also be decreased by maintaining good hygiene, adopting barrier techniques during sexual activity, and properly sterilizing medical equipment.

MORTALITY RATE IN HEPATITIS

Hepatitis death rates vary based on the type of hepatitis virus present as well as numerous other elements like age, general health, access to healthcare, and prompt treatment.

Hepatitis A

Hepatitis A often does not lead to chronic infection or long-term consequences and is a self-limiting illness. Acute hepatitis A has a low overall fatality rate, which is less than 0.6%, according to estimates. However, death rates may be higher in the elderly or in people who already have liver disease.

Hepatitis B

Most persons with acute HBV infection fully recover without experiencing any long-term effects. However, certain people can develop chronic hepatitis B, which increases the risk of cirrhosis, liver failure, and hepatocellular carcinoma (liver cancer) [15]. According to estimates, the annual mortality rate from chronic liver disease brought on by hepatitis B is between 0.5% and 1.0%.

Hepatitis C

Chronic hepatitis brought on by HCV infection raises the risk of cirrhosis, liver failure, and hepatocellular cancer. The risk of death from chronic hepatitis C varies depending on the length of the infection, the presence of concurrent liver disease, and the availability of efficient therapy. Without appropriate care, cirrhosis may develop in 15–30% of people with chronic HCV infection over the course of 20–30 years. According to estimates, 1–5% of people die every year from liver illness brought on by chronic hepatitis C.

It is vital to remember that these death rates are approximations and may change depending on the circumstances of each person. When hepatitis B and C are properly detected and treated, there are now more effective medicines available, which improves results and lowers mortality rates. Viral hepatitis risks can be reduced by early discovery, consistent monitoring, and the right medical attention.

MORBIDITY IN HEPATITIS

The underlying cause, the severity of the infection, and individual characteristics can all affect the morbidity associated with hepatitis. Hepatitis viruses are a frequent source of morbidity all over the world.

Hepatitis A

Usually an acute illness, hepatitis A seldom leads to chronic liver damage. The acute symptoms of hepatitis A, which might

include fatigue, loss of appetite, nausea, abdominal discomfort, jaundice (yellowing of the skin and eyes), and general malaise, are primarily responsible for the disease's morbidity. Hepatitis A usually clears itself without causing longterm issues, although it can occasionally result in acute liver failure, which can be fatal [16].

Hepatitis B

Both acute and chronic illnesses are brought on by hepatitis B. Although acute hepatitis B can cause symptoms comparable to those of hepatitis A, chronic infections typically have a higher morbidity. Chronic hepatitis B infection can result in cirrhosis (liver scarring), increasing liver damage, and an elevated risk of liver cancer. Chronic hepatitis B long-term consequences and morbidity include liver cancer, liver failure, and the requirement for liver transplantation.

Hepatitis C

It is a chronic infection, and the majority of those who contract the virus go on to have chronic hepatitis C. The main cause of the morbidity brought on by chronic hepatitis C is the gradual liver damage that can result in cirrhosis, liver failure, and an elevated risk of liver cancer. Many persons with chronic hepatitis C may go years or even decades without exhibiting any symptoms, which delays diagnosis and raises morbidity. The prognosis for hepatitis C has improved because of developments in antiviral medicines, with many cases potentially being cured.

Hepatitis D

It is a virus that only affects those who have already caught hepatitis B. The higher severity of liver disease in co-infected people is the main cause of the hepatitis D morbidity. Hepatitis D can hasten the advancement of liver damage, which increases the likelihood of developing cirrhosis and the risk of liver failure.

Hepatitis E

Hepatitis E is typically an acute infection and is mostly spread through tainted food or water. Hepatitis E has a similar morbidity to hepatitis A in terms of symptoms, such as fatigue, nausea, abdominal discomfort, and jaundice. Hepatitis E usually clears up on its own without causing long-term problems, but it can have serious morbidity and mortality effects on pregnant women, particularly in underdeveloped nations.

It is crucial to remember that chronic hepatitis infections, such as hepatitis B and C, can go undiagnosed or only exhibit moderate symptoms for many years. Reducing the morbidity linked to chronic viral hepatitis requires regular tests, proper medical treatment, and availability of antiviral medicines.

TEST FOR IDENTIFICATION OF HEPATITIS

For the detection and diagnosis of hepatitis, numerous diagnostics are available. Depending on the probable kind of hepatitis and the healthcare provider's clinical judgment, different tests may be used.

Serology testing for hepatitis look for antibodies or antigens linked to various hepatitis virus types. Depending on whether hepatitis A, B, C, D, or E is suspected, different serology tests will be conducted. Serology examinations can assist in identifying a person's current or historical exposure to a certain hepatitis virus.

Testing for the hepatitis A virus (HAV) involves looking for antibodies to the HAV virus in the blood. Anti-HAV IgM (which indicates a recent infection) and anti-HAV IgG (which indicates a previous infection or immunization) are a couple of examples [17]. Hepatitis B surface antigen (HBsAg), hepatitis B core antibody (anti-HBc), hepatitis B surface antibody (anti-HBs), and hepatitis Be antigen (HBeAg) are some of

the indicators that may be used in HBV testing. These markers aid in identifying if a person is chronically or acutely infected with HBV, whether they have been exposed to the virus before, and whether they have established protection to it through vaccination.

Testing for the hepatitis C virus (HCV): The main HCV test involves finding antibodies to the virus in the blood. If the antibody test is positive, a follow-up test is typically conducted to identify whether the patient has an active HCV infection, such as a nucleic acids test (NAT) or HCV RNA test [18].

When there is a possibility of a co-infection or superinfection with the hepatitis D virus in people who have already contracted hepatitis B, HDV testing is done. Tests include looking for HDV RNA and anti-HDV antibodies. Testing for the hepatitis E virus (HEV) normally entails looking for antibodies, such as IgM and IgG antibodies, in the blood. Sometimes the virus can be found immediately using NAT.

TREATMENT OF HEPATITIS

The hepatitis virus type and illness stage must be taken into consideration while choosing a treatment plan. Viral hepatitis can be classified into several different subtypes, including hepatitis A, B, C, D, and E.

Hepatitis A

Acute Hepatitis A has no specific treatment. Most people heal on their own without any long-term consequences in a few weeks or months. The focus of treatment is on supportive care, which includes rest, a healthy diet, and an avoidance of alcohol and several drugs that can exacerbate liver damage. Hepatitis A infection can be prevented with vaccination.

Hepatitis B

Antiviral drugs such lamivudine, entecavir, tenofovir, adefovir, or telbivudine may be used in the treatment of chronic hepatitis B. These drugs lessen liver damage by suppressing the hepatitis B virus' ability to

replicate. Interferon treatment may be utilized in specific circumstances. A healthcare professional should routinely check on people with chronic hepatitis B.

Hepatitis C

Chronic hepatitis C treatment has made tremendous strides in recent years. The recommended course of treatment is currently direct-acting antiviral (DAA) medicine.

Glecaprevir/pibrentasvir, sofosbuvir/velpatasvir, sofosbuvir/ledipasvir, and sofosbuvir/daclatasvir are some of these medications. Although treatment times can vary, most patients can recover between 8 to 12 weeks. Even when a treatment is successful, ongoing monitoring is still required [19-20].

Hepatitis D

Hepatitis D and the hepatitis B virus are co-infected, and there is no separate antiviral therapy for hepatitis D by themselves. The primary goal of treatment is to control the underlying hepatitis B infection with antiviral drugs.

Hepatitis E

Hepatitis E is often acute and goes away on its own without particular care. Supportive care is advised, including rest, hydration, and staying away from alcohol and some drugs. However, hospitalization may be necessary for closer monitoring and supportive treatment for people with compromised immune systems, pregnant women, particularly those in the third trimester, and those who are pregnant.

CONCLUSION

Hepatitis is the term for liver inflammation, which can be brought on by a few things including viruses, toxins, autoimmune conditions, or metabolic abnormalities. Depending on the kind of hepatitis, different etiology, or the process by which hepatitis develops, occurs. Viral hepatitis, encompassing hepatitis A, B, C, D, and E, is the most prevalent kind. It is crucial to speak with a medical expert who can evaluate your

unique circumstances, symptoms, and hepatitis risk factors. They will be able to suggest the right tests and correctly translate the findings. It is crucial to remember that the prevalence of hepatitis might alter over time because of a variety of factors, including public health initiatives, immunization campaigns, sanitary advancements, and adjustments to high-risk behaviors.

Author(s) Contribution: The data collection,

review, editing and submission were done by F. Sana.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Approval: Not applicable

Conflict of Interest: The authors declare no potential conflict of interest.

Consent for Publication: All authors approved the manuscript for publication.

REFERENCES

1. Puchades Renau L, Berenguer M. Introduction to hepatitis C virus infection: Overview and history of hepatitis C virus therapies. *Hemodialysis International*. 2018 Apr;22:S8-21.
2. Tobler LH, Busch MP. History of posttransfusion hepatitis. *Clinical chemistry*. 1997 Aug 1;43(8):1487-93.
3. Rabe B, Glebe D, Kann M. Lipid-mediated introduction of hepatitis B virus capsids into nonsusceptible cells allows highly efficient replication and facilitates the study of early infection events. *Journal of virology*. 2006 Jun 1;80(11):5465-73.
4. World Health Organization. Introduction of hepatitis B vaccine into childhood immunization services: Management guidelines, including information for health workers and parents. World Health Organization; 2001.
5. Bichko V, Netter HJ, Taylor J. Introduction of hepatitis delta virus into animal cell lines via cationic liposomes. *Journal of virology*. 1994 Aug;68(8):5247-52.
6. Zhang S, Li RT, Wang Y, Liu Q, Zhou YH, Hu Y. Seroprevalence of hepatitis B surface antigen among pregnant women in Jiangsu, China, 17 years after introduction of hepatitis B vaccine. *International Journal of Gynecology & Obstetrics*. 2010 Jun;109(3):194-7.
7. Wright TL. Introduction to chronic hepatitis B infection. *Official journal of the American College of Gastroenterology| ACG*. 2006 Jan 1;101:S1-6.
8. Lindsay KL. Introduction to therapy of hepatitis C. *Hepatology*. 2002 Nov;36(5B):s114-20.
9. Rance J, Treloar C, ETHOS Study Group. 'Not just M ethadone T racy': transformations in service-user identity following the introduction of hepatitis C treatment into A ustralian opiate substitution settings. *Addiction*. 2014 Mar;109(3):452-9.
10. Alter MJ. Epidemiology of hepatitis C. *Hepatology*. 1997 Dec;26(S3):62S-5S.
11. Yeung LT, King SM, Roberts EA. Mother-to-infant transmission of hepatitis C virus. *Hepatology*. 2001 Aug 1;34(2):223-9.
12. Hill JB, Sheffield JS, Kim MJ, Alexander JM, Sercely B, Wendel Jr GD. Risk of hepatitis B transmission in breast-fed infants of chronic hepatitis B carriers. *Obstetrics & Gynecology*. 2002 Jun 1;99(6):1049-52.
13. Krawczynski K. Hepatitis E. *Hepatology*. 1993 May 1;17(5):932-41.
14. Neal KR. Excess mortality rates in a cohort of patients infected with the hepatitis C virus: a prospective study. *Gut*. 2007 Aug 1;56(8):1098-104.
15. Rossa AD, Tavoni A, D'Ascanio A, Catarsi E, Marchi F, Bonicelli W, Salvadori S, Migliorini P, Bombardieri S. Mortality rate and outcome factors in mixed cryoglobulinaemia: the impact of hepatitis C virus. *Scandinavian journal of rheumatology*. 2010 Mar 1;39(2):167-70.
16. Niro GA, Rosina F, Rizzetto M. Treatment of hepatitis D. *Journal of Viral Hepatitis*. 2005 Jan;12(1):2-9.
17. Ghany MG, Strader DB, Thomas DL, Seeff LB. Diagnosis, management, and treatment of hepatitis C: an update. *Hepatology (Baltimore, Md.)*. 2009 Apr;49(4):1335.
18. Choo QL, Weiner AJ, Overby L, Kuo G, Houghton M, Bradley DW. Hepatitis C virus: the major causative agent of viral non-A, non-B hepatitis. *British medical bulletin*. 1990 Jan 1;46(2):423-41.
19. Weinbaum CM, Mast EE, Ward JW. Recommendations for identification and public health management of persons with chronic hepatitis B virus infection. *Hepatology*. 2009 May;49(S5):S35-44.
20. Ali SA, Donahue RM, Qureshi H, Vermund SH. Hepatitis B and hepatitis C in Pakistan: prevalence and risk factors. *International journal of infectious diseases*. 2009 Jan 1;13(1):9-19.