UNIVERSAL JOURNAL OF MEDICAL AND NATURAL SCIENCES
ISSN 2992-8826
https://sr-journals.org/index.php/UJMANS

VIRAL HEPATITIS A

Yusupov Shavkat Raximboevich,
Otajanov Shamsiddin Zerifboevich, Qazaqov Xursand Umidboy o'g'li
Urgench state medical institute

Abstract. Viral infections of the liver have profoundly affected human health, causing substantial illness and death in both acute and chronic disease. Previously of unknown origin, the identification of the responsible viruses sparked extensive scientific efforts to clarify their pathogenesis and to develop diagnostic methods for detecting affected individuals. Rapid advances in science and technology over recent centuries have made it possible to control—and in some cases cure—these infections, with prevention through vaccination playing a central role. Therefore, primary care physicians and gastroenterologists must have a thorough understanding of hepatitis A, B, C, D, and E to effectively manage patients. This review outlines the epidemiology, pathophysiology, clinical manifestations, diagnostic approaches, and current therapeutic strategies, with particular emphasis on emerging treatments and the role of liver transplantation.

Keywords: Hepatitis A, Hepatitis B, Hepatitis C, Hepatitis D, Hepatitis E, Treatment

Introduction. Viral hepatitis has posed a major public health challenge since ancient times, with epidemic outbreaks recorded as early as 5000 years ago in China and descriptions of jaundice reported by Hippocrates in the fifth century BC on the island of Thassos. Advances in technology during the modern era enabled the identification of the causative viruses, and subsequent scientific research has markedly transformed the understanding, morbidity, and mortality associated with these infections. This review aims to present an overview of viral hepatitis, highlighting both current and emerging therapeutic options. Although certain hepatitis viruses remain more prevalent in specific regions of the world, globalization necessitates a basic and comprehensive understanding of each virus, as exposure to any of them is now a realistic possibility in everyday life.

Hepatitis A virus (HAV) was first identified in 1973 by Feinstone, who observed a spherical particle measuring approximately 27 nm using immune electron microscopy in fecal samples from patients with hepatitis A. HAV is a member of the Picornaviridae family and is an RNA virus that causes an estimated 1.4 million infections worldwide each year. In 2016, approximately 7,134 deaths were attributed to HAV infection, with nearly half of all cases occurring in Asia. In the United States, the reported annual incidence was about 2 cases per 100,000 population in 2006. However, more recent outbreaks have demonstrated a marked resurgence, with a 294% increase in reported infections during 2016–2018 compared with the period from 2013 to 2015.

In 1988, approximately 300,000 individuals in Shanghai developed symptoms of hepatitis A following the consumption of raw clams, an event considered one of the largest HAV outbreaks in modern history. In more recent years (2013–2019), several foodborne outbreaks affecting more than 300 patients across multiple states in the United States have been documented. These outbreaks were linked to the consumption of fresh blackberries, frozen strawberries, raw scallops, and pomegranate seeds.

A multicenter study conducted in 2017 across four U.S. states (California, Kentucky, Michigan, and Utah) demonstrated a shift toward large community-based outbreaks driven predominantly by person-to-person transmission. Most reported cases occurred among individuals with injection or non-injection drug use and/or those experiencing homelessness.

According to data from state health departments, more than 37,000 outbreak-related HAV cases were reported between July 2016 and December 2020, resulting in over 22,600 hospitalizations and approximately 350 HAV-associated deaths.

In contrast, 19,947 HAV cases were reported from 24 European Union countries between January and December 2017, representing a fourfold increase compared with the same period during 2012–2015. In 2016, 4,475 outbreak-related cases were reported from 22 European Union countries, with most outbreaks occurring among men who have sex with men.

Hepatitis A virus (HAV) is primarily transmitted via the fecal-oral route, which includes the ingestion of contaminated food or water as well as direct person-to-person contact. Although rare, transmission through blood transfusion has been reported, prompting polymerase chain reaction (PCR) testing for blood donors. After crossing the mucosa of the small intestine, HAV reaches the liver through the portal vein. The virus then replicates within hepatocytes and is secreted into the biliary canaliculi, returning to the small intestine via the bile ducts and ultimately being excreted in the feces. This enterohepatic cycle continues until the host mounts an effective immune response. Liver injury is primarily mediated by HAV-specific $CD8^+$ T lymphocytes and natural killer cells, which target and destroy infected hepatocytes in a human leukocyte antigen-restricted manner.

The typical incubation period for hepatitis A virus (HAV) is approximately 2–4 weeks. The most common presenting symptoms include fever, malaise, and jaundice, while other frequent manifestations are weakness, fatigue, nausea, vomiting, abdominal pain, arthralgias, myalgias, diarrhea, and anorexia [12]. Although uncommon, some patients may experience a prolonged cholestatic phase during recovery, and relapsing infections have also been reported.

Around 10%–15% of patients exhibit a relapsing course within six months of the initial infection, with symptoms generally milder than those of the primary episode. In extremely rare cases, type 1 autoimmune hepatitis has been observed in genetically predisposed individuals. The clinical spectrum of HAV infection ranges from asymptomatic cases without jaundice to symptomatic cases with jaundice, cholestasis with prolonged jaundice, relapsing infections, or acute liver failure.

Laboratory findings typically show serum aminotransferase levels exceeding 1000 U/L, total bilirubin ≤10 mg/dL, and alkaline phosphatase below 400 U/L, with alanine aminotransferase (ALT) usually higher than aspartate aminotransferase (AST). Older patients are more likely to experience severe hepatocellular injury, require hospitalization, and have higher mortality, likely due to reduced liver regenerative capacity and a relatively weaker immune response. Male sex has also been associated with higher mortality. Additional risk factors for acute liver failure include advanced age, pre-existing liver disease, and chronic viral hepatitis. Among patients who develop acute liver failure, poor prognostic indicators include creatinine >2 mg/dL (the strongest predictor), total bilirubin >9.6 mg/dL, and albumin <2.5 g/L.

Hepatitis A virus (HAV) infection can be diagnosed through the detection of specific serum antibodies. The presence of immunoglobulin M (IgM) anti-HAV confirms an acute infection, and these antibodies are detectable at symptom onset. IgM levels typically peak during the acute phase and remain positive for an average of up to four months from the onset of symptoms. Total anti-HAV antibodies are used to assess immunity, either from previous natural infection or vaccination. Detection of IgM antibodies in the absence of symptoms may indicate past infection with persistent antibodies, an asymptomatic infection, or a false-positive result.

Routine liver biopsy or imaging is not necessary for diagnosis. When performed, liver biopsy may reveal marked portal inflammation with relatively mild necrosis, Kupffer cell proliferation, acidophil bodies, or hepatocyte ballooning, features that are generally less pronounced than those seen in other viral hepatitis infections.

There is no specific antiviral treatment for hepatitis A virus (HAV); management is primarily supportive and focuses on relieving symptoms. Prevention of transmission through improved sanitation remains a key public health measure. Historically, immunoglobulins were used for HAV prophylaxis, but with the advent of effective vaccines, their use is now largely limited to infants under 12 months of age. Since 2007, post-exposure prophylaxis with the hepatitis A vaccine has been approved for immunocompetent individuals aged 12 months to 40 years without chronic liver disease.

An inactivated HAV vaccine has been licensed in Europe since 1991, and a live attenuated vaccine has been used in China since 1992. The inactivated vaccine was first approved in the United States in 1995 and is administered as a 2- or 3-dose series, with doses spaced at least six months apart depending on the formulation. In 1996, the Advisory Committee on Immunization Practices (ACIP) recommended vaccination for individuals at high risk of HAV infection or its complications. This was expanded in 2006 to include routine vaccination for all children aged 12–23 months, and in 2019, ACIP further recommended routine vaccination for people experiencing homelessness.

Conclusion. Understanding the epidemiological patterns and clinical characteristics of hepatitis A, B, C, D, and E is essential for accurate diagnosis and effective patient management. Advances in medical science over recent decades have enabled precise diagnosis and a comprehensive appreciation of the multisystemic impact of these infections. With the development of new therapeutic options, controlling these diseases has become increasingly feasible, and achieving cure and eventual eradication—particularly for chronic hepatitis B, C, and D—appears to be within reach.

REFERENCES

1. World Health Organization. Global Hepatitis Report 2017. [cited 15 April 2021]. In: World Health Organization [Internet]. Available from: https://www.who.int/hepatitis/publications/global-hepatitisreport2017/en
2. Aslam A, Campoverde Reyes KJ, Malladi VR, Ishtiaq R, Lau DTY. Management of chronic hepatitis B during pregnancy. Gastroenterol Rep (Oxf) 2018; 6: 257-262 [PMID: 30430013 DOI: 10.1093/gastro/goy025]
3. Thio CL, Guo N, Xie C, Nelson KE, Ehrhardt S. Global elimination of mother-to-child transmission of hepatitis B: revisiting the current strategy. Lancet Infect Dis 2015; 15: 981-985 [PMID: 26145195 DOI: 10.1016/S1473-3099(15)00158-9]
4. Alter MJ. Epidemiology of hepatitis B in Europe and worldwide. J Hepatol 2003; 39 Suppl 1: S64S69 [PMID: 14708680 DOI: 10.1016/s0168-8278(03)00141-7]
5. Tran TT. Hepatitis B in Pregnancy. Clin Infect Dis 2016; 62 Suppl 4: S314-S317 [PMID: 27190321 DOI: 10.1093/cid/ciw092]
6. World Health Organization. Global health sector strategy on viral hepatitis 2016–2021. [cited 15 April 2021]. In: World Health Organization [Internet]. Available from: https://apps.who.int/iris /bitstream/handle/10665/246177/ WHO-HIV-2016.06-eng.pdf?sequence=1
7. Jonas MM. Hepatitis B and pregnancy: an underestimated issue. Liver Int 2009; 29 Suppl 1: 133-139 [PMID: 19207977 DOI: 10.1111/j.1478-3231.2008.01933.x]
8. Sarin SK, Kumar M, Lau GK, Abbas Z, Chan HL, Chen CJ, Chen DS, Chen HL, Chen PJ, Chien RN, Dokmeci AK, Gane E, Hou JL, Jafri W, Jia J, Kim JH, Lai CL, Lee HC, Lim SG, Liu CJ, Locarnini S, Al Mahtab M, Mohamed R, Omata M, Park J, Piratvisuth T, Sharma BC, Sollano J, Wang FS, Wei L, Yuen MF, Zheng SS, Kao JH. Asian-Pacific clinical practice guidelines on the management of hepatitis B: a 2015 update. Hepatol Int 2016; 10: 1-98 [PMID: 26563120 DOI: 10.1007/s12072-015-9675-4]
9. European Association for the Study of the Liver. EASL 2017 Clinical Practice Guidelines on the management of hepatitis B virus infection. J Hepatol 2017; 67: 370-398 [PMID: 28427875 DOI: 10.1016/j.jhep.2017.03.021]
10. Terrault NA, Lok ASF, McMahon BJ, Chang KM, Hwang JP, Jonas MM, Brown RS Jr, Bzowej NH, Wong JB. Update on prevention, diagnosis, and treatment of chronic hepatitis B: AASLD 2018