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Perspective

Viral hepatitis: Indian scenario

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ABSTRACT

Viral hepatitis is a cause for major health care burden in India and is now equated as a threat comparable to the "big three" communicable diseases – HIV/AIDS, malaria and tuberculosis. Hepatitis A virus and Hepatitis E virus are predominantly enterically transmitted pathogens and are responsible to cause both sporadic infections and epidemics of acute viral hepatitis. Hepatitis B virus and Hepatitis C virus are predominantly spread via parenteral route and are notorious to cause chronic hepatitis which can lead to grave complications including cirrhosis of liver and hepatocellular carcinoma. Around 400 million people all over the world suffer from chronic hepatitis and the Asia-Pacific region constitutes the epicentre of this epidemic. The present article would aim to cover the basic virologic aspects of these viruses and highlight the present scenario of viral hepatitis in India.

Introduction

Viral hepatitis is a cause for major health care burden in India and is now equated as a threat comparable to the "big three" communicable diseases – HIV/AIDS, malaria and tuberculosis.[1] Hepatitis A virus (HAV) and Hepatitis E virus (HEV) are predominantly enterically transmitted pathogens and are responsible to cause both sporadic infections and epidemics of acute viral hepatitis (AVH). Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are predominantly spread via parenteral route and are notorious to cause chronic hepatitis, which can lead to grave complications including cirrhosis of liver and hepatocellular carcinoma (HCC). Around 400 million people all over the world suffer from chronic hepatitis and the Asia-Pacific region constitutes the epicentre of this epidemic.[1] The present article would aim to cover the basic virologic aspects of these viruses and highlight the present scenario of viral hepatitis in India.

HAV

HAV is a single-stranded RNA virus belonging to the family Picornaviridae. It is spread via the faecal–oral route and is closely associated with poor sanitary and bad hygienic conditions. HAV infection is common during childhood in developing countries like India and usually results in mild anicteric hepatitis. Majority of children (85%) below the age of 2 years and around 50% aged between 2 and 5 years have non-specific symptoms and are usually anicteric.[2] However, HAV infection was reported to cause severe disease with increasing age of the patient and with the presence of underlying chronic liver disease.[3,4] The case fatality rate has been mentioned to be

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the highest in patients over the age of 50 years (1.8%) when compared to younger adults (0.3%).[3]

Scenario in India

HAV is responsible for several outbreaks of sporadic viral hepatitis in India. In a recent study by Rakesh et al. from Kerala, HAV was identified as the aetiology for an outbreak of AVH at Mylopore village of Kollam district. The authors noted a high attack rate in subjects aged 15–24 years (4.6%) when compared to subjects aged 5–14 years (3.1%). Pipe water contamination from a borewell was identified as a source of infection in this village.[5] In an elegant study by Acharya et al., the seroprevalence of anti-HAV antibodies was assessed in 1424 school children aged between 4 and 18 years and 93.2% of children were found to have anti-HAV antibodies in their sera. The seroprevalence of anti-HAV was also assessed in 256 patients with underlying chronic liver disease and 97.6% tested positive indicating the high seroprevalence of HAV in India.[6] In another study from Kottayam, HAV was deemed responsible for an outbreak of AVH in the medical college area and the authors emphasized on the need for a definite policy for control of viral hepatitis.[7] In a study from Lucknow, 267 patients with AVH were evaluated and HAV was identified as the most common aetiology responsible in 26.96% patients followed HEV in 17.97%.[8]

However, in the recent times there has been a sero-epidemiological shift in HAV infection in India, with increasing incidence of infection being noted in the adult and adolescent population compared with children. Arankalle et al. in their study on 928 children aged between 18 months and 10 years attempted to estimate the age-related seroprevalence of HAV. Of the 348 children who tested positive for anti-HAV, 50.3% were in the age group of 6–10 years and 30.3% were in the 18 months to 6 years age group. It was also noted that the seropositivity of HAV was closely linked to the educational and socioeconomic status of the parents. Subjects who used a private toilet within the house were less often seropositive (33.1%) when compared to subjects who used an open field for excreta disposal (75%). This study clearly demonstrated the higher seroprevalence of HAV in older children and established a clear link between improved living standard and decreased seropositivity of HAV.[9]

Prevention of HAV infection

Improving the sanitary conditions and provision of safe, clean drinking water forms an imperative pillar in curtailing the spread of the HAV. Simple methods like maintaining proper hand hygiene is an effective method to curtail the virus. Vaccination forms a cornerstone in preventing HAV and both inactivated and live attenuated vaccines are available for use. The inactivated vaccine is derived from the HM 175/GBM strain whereas the live attenuated vaccine is derived from the H2 strain of the virus.

Vaccination in India

Indian Academy of Pediatrics recommends two doses for any of the licensed vaccines which have to be given 6 months apart to children aged 1 year or older. The dose recommended is 720 ELU for those aged <19 years and 1440 ELU for those above. Protective titres of antibodies are seen in almost 100% after the second dose of injection.[2] Adverse reactions are minor and usually include local pain and swelling.

HEV

HEV is positive-stranded RNA virus belonging to the family hepeviridae. HEV has 4 genotypes of which genotypes 1 and 2 exclusively infect humans whereas genotypes 3 and 4 also infect several other mammalian species. HEV is primarily spread via the faecal–oral route and is an enterically transmitted pathogen like HAV. The incubation period of HEV infection is estimated to be around 2–9 weeks and during an epidemic of HEV, anicteric hepatitis is more common than icteric hepatitis and clinical hepatitis is seemingly more frequent in adults than in children aged <15 years.[10] In addition to the classical routes described, HEV is also reported to spread by blood transfusion and via allograft.[11,12] HEV infection can also cause, albeit rarely, a chronic hepatitis which occurs when HEV replication persists for at least 6 months. Chronic HEV infection is classically described with HEV genotype 3 and can lead to cirrhosis in immunosuppressed patients and in patients undergoing a solid organ transplantation.[13]

Scenario in India

HEV is responsible for majority of the sporadic and epidemic cases of AVH in India.[14,15] The major epidemics caused by HEV in India are highlighted in Table 1.[10] During an HEV epidemic, the secondary attack rate among the household contacts is estimated to be about 0.7–2% when compared to 50–75% for HAV.[16] During an outbreak, it is observed that pregnant women have a higher likelihood to get infected (12–20%) with HEV and have a higher propensity to develop acute liver failure (ALF) (10–22%) when compared to non-pregnant females and males (1–2%).[10] However, once ALF develops, it is noted that the pregnancy per se does not alter the mortality when compared to non-pregnant females and males.[17]

In a study from Rajasthan, HEV infection among acute sporadic hepatitis was studied. 736 patients suspected to have viral hepatitis were evaluated and HEV was noted to be the predominant pathogen responsible in 49.7% of patients.[18] Khuroo et al. studied the spectrum of HEV infection in India and noted that 92% (23/25) of patients with epidemic non-A, non-B hepatitis had acute HEV infection. Cholestasis was

Table 1 – Major HEV epidemics in India.

Location	Year	Number of infected subjects
Delhi	1955	29,300
Aurangabad	1961	865
Siliguri	1966	4287
Ahmedabad	1975	2572
Kanpur	1990	79,091
Nellore	2008	23,915