This is hepatitis: Know it, confront it

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This is hepatitis: Know it, confront it
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Liver is the barrier between the environment and the human body and has multiple synthetic, metabolic, detoxifying, homeostatic and immune functions. Therefore, during evolution, liver has acquired substantial reserve as well regenerative capacity. While such reserve and regenerative capacity imparts protective effect, the diseases of liver do not clinically manifest until substantial hepatic reserve or hepatocyte loss ensues. Most liver diseases in their initial stages remain silent. Hepatitis is the most common ailment of liver and is usually caused by various hepatotoxic agents such as hepatitis viruses, alcohol, drugs, toxins, excessive fat, etc.

Hepatitis is a term used to describe inflammation of the liver and its consequences. Viral hepatitis is caused by five hepatitis viruses A through E. While hepatitis A virus (HAV) and hepatitis E virus (HEV) are transmitted by contaminated water and food through the enteric route, hepatitis B, C and D are parenterally transmitted viruses (through unsterile needle, instrumentation, transfusion, sexual route and from pregnant mother to the baby during child birth). All the hepatitis viruses can cause acute hepatitis, but only HBV and HCV are major cause of chronic hepatitis, cirrhosis and liver cancer globally1.

Viral hepatitis is a major public health problem in our country as India is hyperendemic for hepatitis A and E1,2,3,4,5,6. Hepatitis A and E viruses have been responsible for most of the epidemics of hepatitis in this country1,2,3,4,5,6. In the sporadic situation, hepatitis E was reported to be the major cause of acute hepatitis in 30-70 per cent of the cases and has been incriminated as the major cause of acute liver failure (ALF)7. Hepatitis A is the predominant aetiology of acute hepatitis in the paediatric age group8,9. Dual infection of hepatitis A and E was reported as the major cause of ALF among children10.

About 30 million hepatitis B virus (HBV) carriers without any symptomatic liver disease are present in India11,12. Depending on the carrier frequency, the world has been categorized into high endemic zone for HBV (carrier frequency of >8% in population), intermediate endemic zone (carrier frequency of 2-8%) and low endemic zone (carrier frequency of less than 2%)11 India, with a carrier frequency of about 3 per cent (2 to 4%) has been placed in the intermediate endemic zone. Hepatitis C virus infection frequency, evaluated by anti HCV antibody positivity has been reported to be between 1-2 per cent among voluntary blood

donors and 0.87 per cent in the community11, which is similar to that seen in the developed and industrialized countries like Japan and USA13. HBV and HCV are parenterally transmitted and cause both acute as well as chronic disease. About 15 to 30 per cent of acute hepatitis in India are due to HBV11, however, HCV as a cause of acute icteric hepatitis has been infrequent, but remains as the major cause of post-transfusion hepatitis. HBV is the major cause of chronic hepatitis, cirrhosis and primary liver cell cancer in India11. About 50 per cent of patients with chronic liver diseases are due to HBV and 20 per cent are due to HCV1. Frequency of hepatitis D virus infection among both acute and chronic HBV patients in India has been reported to be infrequent1. Approximately 2.5 lakh patients die annually due to viral hepatitis and its sequlae1.

These data indicate that the magnitude of viral hepatitis in India is substantial. During the last three decades, substantial information on the viral genomics, diagnostic assays, understanding of pathogenesis, natural course, therapy against the viruses and sequels of liver disease has been generated. These advances have resulted in a situation to prevent and cure viral hepatitis globally. However, in India we have yet to use this information in an organized and structured manner to devise effective control strategy for viral hepatitis. It has become necessary now to increase the awareness about these advances among the health care providers to establish capability with an aim to control viral hepatitis in India.

The most established and effective method to control viral hepatitis is prevention of the infection. The two well known methods to prevent hepatitis viral infection would include: (i) interruption of the route of transmission, and (ii) vaccination against the specific virus.

HAV and HEV infections occur due to their transmission through enteric route by contaminated water and food. In rural India, defecating in the open is common and in many cities like Delhi, the sewerage and water supply pipelines are adjacent leading to contamination of water from the corroded sewage lines1,2,3,4,5,6. This is the major source of well water contamination in the rural areas and the water supply pipelines in urban areas, especially during the rainy season1,2,3,4,5,6. An improvement in sanitation, provision of clean drinking water, proper sewage disposal, public education and awareness of defecation habits are the mainstay for the prevention of epidemics of hepatitis A and E. Person to person contamination has been documented in HAV infection but not in HEV, therefore, HAV infected patient may require to take necessary precaution to avoid person to person transmission1. However, simple awareness that ‘these viruses can be eradicated by boiling water at 100 degree centigrade or by appropriate chlorination’ can be very effective1. Similarly, interruption processes of transmission of HBV and HCV through parenteral route have been well established1. Despite the similarity of transmission route and pattern of HIV and HCV, their transmission dynamics varies in India. The most frequent cause of HCV transmission has been implicated to transfusion of blood and blood products, unsafe injection practices and, haemodyalisis in patients with chronic renal failure1. HBV even though is transmitted through all the above mentioned routes, the presumable cause of most of the HBV transmission in India is childhood infection either through horizontal transmission or vertical transmission from mother to baby1. Unsafe injection practices have been documented to cause HBV epidemics in India and other parts of the globe14. Another route of

transmission of these two parenterally transmitted viruses is the nosocomial infections and to high risk individuals comprising various health care workers15. Based on the information strategies have been devised to prevent the transfusion related transmission by donor screening of various transfusion transmitted virus infection, use of safe injection practices, protocols for post exposure prophylaxis with which effective reduction of HBV and HCV infection has been documented.

Effective vaccines to prevent HBV and HAV infections are commercially available and many countries have included these in their universal immunization programmes1. Inclusion of HBV vaccine in the universal immunization schedule would be the most cost effective strategy to decrease HBV carrier frequency and disease burden in India. Aggarwal et al16,17 have reported that if horizontal transmission is the predominant mode of HBV transmission in India, then the universal immunization would be more cost-effective than selective immunization. While adopting universal immunization, programmes to evaluate durability of protection, appearance of vaccine escape mutants, compliance frequency of population may be relevant for a successful HBV control. The countries where HBV vaccination has successfully decreased the carrier frequency and disease burden, at least 80% of target population has been vaccinated1,8. Post needle prick HBV transmission dynamics are not available from this country. Therefore, post needle stick injuries should be dealt with as anywhere else, i.e. with passive active immunization combining hepatitis B immune globulin (HBIG) and HBV vaccine. Preventive steps for household contacts, nosocomial spread must be included in the prevention strategy of HBV control in India. HBV vaccination of all household contacts and medical/paramedical staff should be recommended1.

Due to extremely high prevalence of anti HAV protective antibody in general population, (both adult and paediatric population)8, mass immunization against HAV would not be cost effective in India. HAV vaccine is expensive while the test to detect presence of anti HAV antibody is cheap. Two candidate vaccines against HEV has been tested in endemic region of HEV with a short term protection in about 95 to 98 per cent of the people, but till date these are not commercially available19. With their availability, at risk population (during onset of epidemics, pregnant females who are prone to contract HEV infection and are known to develop severe liver disease, and patient with chronic liver disease who develop rapid decompensation with HEV superinfection)14 are likely to benefit and avail protection against the HEV infection.

While prevention of these hepatitis virus infections ultimately decreases the disease burden and the disease related morbidity and mortality in long term, it is imperative to identify the infected individuals particularly with chronic HBV and HCV infections. Advances in therapy for chronic HCV and HBV infections have resulted in cure (for HCV) and control (for HBV) of such chronic liver diseases. Chronic HBV and HCV infection may remain silent and, therefore, high risk groups such as individuals with history of transfusion, dental interventions, surgery, unsafe sexual exposures, household contacts of index HBV cases, etc. need screening for such infections. Antivirals and immunomodulators like interferons to eradicate these viruses have been developed and tried successfully in these patients, and have become the mainstay of therapy in such patients. The most dangerous sequel liver cancer at

an early stage is curable and patients with end stage liver diseases with overt liver failure can be subjected to liver transplant whose results are excellent (5 year survival reaching up to 75 to 80%)1. Today hepatitis and its sequel can be treated with an aim to cure or control these effectively to obtain a normal quality of life. Today all experts dealing with the liver believe that “Hepatitis is preventable and curable”.

Hepatitis due to hepatitis viruses detected at any stage of its natural course can be managed efficiently with resultant benefit. Knowledge about the virus, the way it is transmitted, its diagnostic processes, and intervention strategy are clearly defined and can be used widely. Knowing about it will be the way to confront it and control it. Ultimately, we aim to eradicate it. However, such results will be possible only by co-ordinated, persistent, evidence based, cost-effective strategies involving multidisciplinary teams such as epidemiologists, hepatologists, transplant surgeons, virologists, cellular biologists, and pharmaceutical and administrative agencies. The most important of all the control strategies is the people's awareness and participation in controlling these menacing ailments.

Reference

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