VIRAL HEPATITIS – PRAGMATIC APPROACH TO ITS CHALLENGE IN INDIA

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Abstract:

There are, at least, five different hepatitis viruses (HAV to HEV) that primarily target the liver in humans, whereas the role of sixth virus (HGV) is doubtful. Although symptoms produced are similar, these viruses differ greatly in their structure, mode of replication and transmission, thus requiring altogether different control/ approach strategy. An attempt is made to review in brief the salient features of these viruses with major emphasis on HBV that has attained / become a major public health problem in India.

Key Words: *Viral hepatitis, complications, transmission, preventive measures*

Introduction :

Hepatitis is a feature of many viral diseases usually resulting as a part of generalized infection which involves also the liver, e. g., yellow fever, cytomegalovirus and Epstein- Barr virus infections. In contrast, some viruses that primarily target liver are collectively named as hepatitis viruses. There are, at least, five different hepatitis viruses (HAV to HEV) that primarily target the liver in humans, whereas the role of sixth virus i.e., HGV is doubtful[1, 2]. Although basic symptoms produced are similar, these viruses differ greatly in their structure, mode of replication and transmission, thus requiring altogether different control/ approach strategy.

Disease spectrum

Hepatitis viruses produce a broad clinical spectrum of illness ranging from asymptomatic to that of symptomatic such as malaise, anorexia, nausea, abdominal pain, fever and jaundice. Sometimes, an acute liver failure is produced which is life-threatening[3]. Icteric phase of the infection is seen due to yellow tinging of the skin, sclera and mucous membrane and the jaundice produced is obstructive in type with raised bilirubin, dark bile- containing urine and the passing of pale stool by the infected individuals. The liver function tests are abnormal with raised serum transaminase levels i.e., alanine aminotransferase (ALT). Though the duration of the illness is variable, it usually lasts for 2 – 3 weeks. Anicteric hepatitis is also seen in all the forms of viral hepatitis along with disturbances of liver function, fever and other constitutional signs and symptoms but no frank jaundice. Thus, clinically these infections are difficult or rather impossible to distinguish from one and another.

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Hepatitis viruses and infections

All hepatitis viruses are RNA viruses except HBV (Hepadnavirus) which is a DNA virus. HAV (Picornavirus) and HEV (Calcivirus) are transmitted by the faeco-oral route and both the type of infections resolve and do not usually result in a carrier stage. In contrast, HBV, HDV (Delta) and HCV (Flavivirus) are transmitted through blood and the blood products/ equipments and by the sexual transmission that may result into chronic carriage in around 2- 3% cases each with HBV and HCV infections[4]. Despite commercially available serological tests, approximately 30- 40% of the viral hepatitis cases still remain unclassified. This has thus led to the speculation that other newer hepatotropic viruses like hepatitis G virus (HGV), Sen virus and TT viruses (TTV) might be responsible for most of these non- A to non- E cases of viral hepatitis. However, not enough evidence is available suggesting that these viruses do not directly infect the liver which is rather being affected as a bystander[1,2].

HAV infections mostly or rather exclusively occur in children who usually become immune after the infection, therefore infection in adults is rarely seen. However,

limited data available in India has revealed an increasing trend in the prevalence of HAV infection both in children (increased from approx. 8% to 12%) and in adults (increased from approx. 3% to 12%) as reported from Delhi[5]. Also with an advent of an outbreak of HAV that resulted from contamination with sewage treatment plant in Kerala[6], emphasizing the need of taking proper control/ preventive measures so as to avoid the recurrence of such episodes in future.

About 15% to 30% of the acute viral hepatitis cases caused in India are due to HBV out of which almost 40% of the cases present with sub acute hepatic failure. HCV infections as like that of HBV are acquired mostly through the transfusion of blood and blood products in India. Therefore, the magnitude of HCV infections in India amongst the patients of chronic liver is likely to increase in future after introduction of the mandatory policy of HCV testing in all the blood banks throughout the country. Recently, a study carried on blood samples obtained from eight blood banks of seven Indian major cities including Delhi and Mumbai has reported a sero-prevalence of 1.12% of HBV (by HBsAg detection) and 0.33% positivity for HCV (by anti-HCV antibodies)[7].

The infection with HEV is considered benign but during epidemics which have frequently being experienced in some parts of India that are associated with severe liver disease affecting most of the pregnant women (12- 20%) than to non- pregnant women (1- 2%) and men[3]. Also mortality is much higher in pregnant women who are affected by HEV during the epidemics. Furthermore, about 10% of the patients with acute or chronic HBV infection are reported to be super- infected with HDV[8].

Fulminant hepatitis with massive liver necrosis (acute yellow atrophy) may lead to liver failure, coma and, very often resulting in death. Such a complication is rarely seen in case of HAV, more common with HBV and a particular problem with HEV especially during pregnancy, amongst children and in dual infections of HAV and HEV[3]. Asymptomatic HBV carriers may also get super-infected with HBV leading to severe disease. Persons with persistent chronic HBV or HCV infections are further prone to increased risk of cirrhosis and liver failure, and may sometimes even lead to a relatively high risk of liver cancer. Also chronic HBV infected persons are the major source of the virus spread and are further at risk of acquiring fulminant disease if get infected with HDV[8].

Preventive measures

Since faeco- oral route transmitted viral hepatitis, particularly the HEV infection is rampant in India both in epidemic and sporadic forms, the preventive measures should therefore be/ are aimed at providing clean drinking water, proper sewage disposal and health education. Such measures if taken properly will also help in prevention of many of the HAV infections for which, no doubt, vaccine is available for the non-immune persons who are revealed negative by the absence of anti- virus IgG antibodies in their sera/ blood. Also studies carried out administering recombinant HEV in monkeys orally which have protected the animals against experimental HEV infection, thereby raising a strong possibility of a vaccine for the human use in near future[9]. Since epidemiological data reflect that HBV is causing and producing a considerable disease burden as about 40 million persons in India are infected with HBV[10], therefore the basic need is to target high risk groups/ population employing hepatitis B vaccination. HBV is present invariably in almost all the secretions of the infected persons and is known to cause infection even without an intimate contact. The medical and para-medical personnel/ staff are hence required to take all due precautions/ preventive measures while handling the HBV infected persons/ patients. Further, about 12 million people in India are infected with HCV, for which no vaccine is yet available; therefore preventive measures as applicable to HBV gain an utmost importance for HCV also.

Conclusions

As HBV attained and become a major problem, hepatitis B vaccination has been brought in India under National Immunization programme by the Health Ministry. Therefore, the vaccine is to be administered to all the children on their 4th, 6th and 12th week of age

in combination with DPT[16]. However, some different views have appeared advocating a selective vaccination strategy such as identifying B- positive mothers serologically and vaccinating the newborns within 48 hrs. of birth as being followed in Japan, U. K. and Netherlands which are having low disease prevalence[12]. Further, emphasis has to be laid on proper quality control of donors' screening in India with particular stress on specific tests for detection of the infection during the window period. Although sensitive serological test available have shortened the sero-conversion window period, still a number of newly infected donors remain undetected that are responsible for the virus transmission. The serological tests may sometimes also fail to detect some of the infected persons due to non- or delayed sero-conversion as well as occult infections including the infection caused by different subtypes/ variants[13]. Therefore, effective awareness campaigns especially through multi- media and by other means are to be undertaken on the risk of community- acquired viral infections and their prevention particularly, the nosocomial spread of the viruses which deserves special attention. Public health agencies should undertake various measures in making general public aware of the advantages of following proper hygienic conditions so as to reduce the transmission of viral hepatitis and their load thereon.

References

1. Abraham P. GB virus C/ hepatitis G virus- its role in human disease redefined? *Indian J. Med. Res.* 2007; 125: 717- 19.
2. Kar P. Viral hepatitis- it is still a challenge in the Indian subcontinent? *Indian J. Med.Res.* 2007; 125: 608- 11.
3. Acharya SK, Panda SK, Saxena A *et. al.* Acute hepatic failure in India: A prospective from the East. *J. Gastroenterol. Hepatol*. 2000; 15: 473- 79.
4. Tewari R, Aggarwal A, Devi P. Sero- prevalence of hepatitis B, hepatitis C and human immunodeficiency viruses amongst drug users in Amritsar. *Indian J. Med. Microbiol.* 2006; 24: 151-52.
5. Hussain Z, Das BC, Husain SA. *et al*.. Increasing trend of acute hepatitis A in north India: Need for identification of high risk population for vaccination. *J. Gastroenterol. Hepatol*. 2006; 21**:** 689-693.
6. Arankale VA, Sarda Devi KL, Lole KS. *et. al.* Molecular characterization of hepatitis A virus from a large outbreak from Kerala, India. *Indian J. Med. Res.* 2006; 123:760-69.
7. Makroo RN, Choudhary N, Jagannath L. *et al*. Multicenter evaluation of Individual donor nucleic acid testing(NAT) for simultenous detection of human immunodeficiency virus-1 Hepatitis B & C viruses in Indian Blood Donors. *Indian J. Med. Res.* 2008; 127: 140-147.
8. Irshad M, Acharya SK. Hepatitis D virus (HDV) infection in severe forms of liver diseases in north India. *Eur J. Gastroenterol. Hepatol*. 1996; 8: 995 -98.
9. Li TC, Suzaki Y, Ami Y, Dhole TN. *et. al.* Protection of cynomolgus monkeys against HEV infection by oral administration of recombinant hepatitis E virus like particles. *Vaccine* 2004; 22 : 370-77.
10. Khan M, Dong JJ, Acharya SK. *et al*. Hepatology issues in Asia: Perspectives from regional leaders. *J Gastroenterol Hepatol* 2004; *19* (Suppl 7) : S419-30.
11. Sinha K. Hepatitis B threat bigger than AIDS- A news item. *The Times of India*, Pune, Wednessday, Sep. 7, 2005, pg. 1.
12. Phadke A. Hepatitis B a false alarm- A news item. *The Times of India*, Pune, Tuesday, Sep. 13, 2005, pg. 12.
13. Borkoty BJ, Mahanta J, Biswas D. *et al.* Circulating genotypes of hepatitis B virus in Arunachal Pradesh. *Indian J. Med. Res.* 2008; 127: 65-70.