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REVIEW ARTICLE
VIRAL HEPATITIS AND PREVENTING THE OPERATING ROOM STAFF FROM THIS GROWING MENACE

Tariq Hayat Khan

Viral hepatitis is the single most important cause of liver disease in Pakistan and worldwide. Hepatitis B & C is now spreading beyond endemic dimensions. More and more patients with hepatitis are being received for surgical operations for related or unrelated surgical problems. Still a sizeable number of patients may have undiagnosed hepatitis B or C, and pose serious threat to operating room staff.

The prevalence of hepatitis B (HBV) infection varies considerably across Pakistan because of the heterogeneity of our population, but the detection of new cases has reached alarming rates. The government has taken up major steps to produce public awareness through a campaign in newspapers and television. The reuse of disposable syringes is on a decline although this tendency still needs to be curbed with strong legislation. The proportion of HBV infected patients who are HBeAg-positive also varies amongst the different groups[1]. HBeAg-positivity ranges from 20% to 46% for Asian immigrants and 55% for Indochinese immigrants to USA. The majority of HBeAg-positive cases occur in the young immigrant population.

Following acute HBV infection, the percentage of infected patients who become carriers varies with age. The risk is greatest in the very young and in the elderly. Although acute hepatitis B continues to be an important clinical problem, the majority of acute cases will resolve and clear HBsAg spontaneously. Chronic HBV infection, established when HBsAg is detectable for longer than 6 months with or without continuing liver enzyme abnormalities, accounts for the greatest burden of disease[2].

The course of chronic hepatitis B is highly variable, characterized in some patients by exacerbations and remissions of inflammatory activity in the liver, in others by continuous active hepatitis of varying degrees of severity, and in yet others by trivial inflammation. The disease can be described by three phases[3]. The first phase, the so-called immuno-tolerant phase, is characterized by high levels of virus in serum, and no or minimal hepatic inflammation[4]. These patients are HBeAg-positive. This is followed by the "active" phase, during which there is intermittent or continuous hepatitis of varying degrees of severity.[4,5,6,7] Seroconversion to anti-HBe-positive may occur during this phase, but cessation of inflammatory activity does not always follow. The third phase is the inactive phase during which viral concentrations are low, and there is minimal inflammatory activity in the liver[2]. In general, patients who clear HBeAg have a better prognosis than patients who remain HBeAg-positive for prolonged periods of time do[8]. About 1%/year of anti-HBe-positive patients will clear HBsAg[9]. However these patients remain at risk for hepatocellular carcinoma. One of the major mechanisms by which seroconversion occurs (possibly the only mechanism) is by the development of the so-called "pre-core mutant"[10]. This is a mutation which arises during the course of infection, and which results in inability of the virus to produce HBeAg. The virulence of this mutant is uncertain. Patients who are anti-HBe-positive with elevated ALT concentrations and detectable HBV DNA almost all carry the pre-core mutant.

For Correspondence:
Lt Col Tariq Hayat Khan
Classified Anaesthetist, CMH Multan.

Patients with hepatitis B-induced cirrhosis who are anti-HBe-positive have a 97% 5-year survival, compared to a 72% survival for those who are HBeAg-positive[11]. Once hepatic decompensation occurs in anti-HBe-positive patients, the survival at 5 years is only 28%, whereas in HBeAg-positive patients the 4-year survival is zero[12]. Patients with chronic hepatitis B are at risk for the development of hepatocellular carcinoma[13].

HEPATITIS C

It appears that the hepatitis C virus (HCV) emerged in the U.S. population beginning in the 1960s, related to blood transfusion and injection drug use, although the extent of the problem was only apparent after 1990 when reliable blood tests first became available for hepatitis C. Studies of the natural history have been somewhat contradictory but indicate that over the first 20 years of chronic HCV infection, 20% of chronically infected patients will develop cirrhosis, and many of those will progress to hepatocellular carcinoma. HCV-associated end-stage liver disease is now recognized as a leading indication for liver transplantation in the United States and the developed western world.

Unlike hepatitis B, it has no vaccine to protect, and it has a more virulent course of progression. Currently, there are about 200 million people worldwide who are infected with the Hepatitis C virus, 4.9 million of those are in the United States (estimates go as high as 15 million) and 5 million in Western Europe. The prevalence seems to be higher in Eastern Europe than in Western Europe. In industrialized countries, HCV accounts for 20% of cases of acute hepatitis, 70% of cases of chronic hepatitis, 40% of cases of end-stage cirrhosis, 60% of cases of hepatocellular carcinoma and 30% of liver transplants. The incidence in our country is unknown, but according to a reasonable estimate over 1% of our population is infected with this disease, and the number is steadily increasing due to lack of civic facilities, and lack of public awareness.

The incidence of new symptomatic infections has been estimated to be 13 cases/100,000 persons annually. For every one person that is infected with the AIDS virus, there are more than four infected with Hepatitis C. The CDC estimates that there are up to 230,000 new hepatitis C infections in the U.S. every year. Currently, 8,000 to 10,000 deaths each year are a result of HCV.

Chronic hepatitis C is predicted to become a major burden on the health care system as patients who are currently asymptomatic with relatively mild disease progress to end-stage liver disease and develop hepatocellular carcinoma. Predictions in the USA indicate that there will be a 60% increase in the incidence of cirrhosis, a 68% increase in hepatoma incidence, a 279% increment in incidence of hepatic decompensation, a 528% increase in the need for transplantation, and a 223% increase in liver death rate.

There is no vaccine and no completely effective treatment! Although a number of new drugs have been introduced recently, and a combination treatment has been suggested, the control or cure rate is still discouraging. The long-term results may shed a ray of hope.

Information on the rates of development of chronicity after an initial HCV infection comes largely from studies of post-transfusion hepatitis. In these studies viral clearance from serum occurred in about 20-30% of patients initially infected with hepatitis C. It is not known whether this is also true for hepatitis C acquired through other routes. To be confident that viral clearance has been achieved PCR-based assays must be used. Negative HCV RNA by PCR assays indicate viral clearance from serum, but give no information about the state of HCV in the liver or in other privileged niches (e.g., lymphocytes). Thus, given the current state of knowledge complete viral clearance cannot be ascertained with certainty.

Therefore, patients who are anti-HCV-positive who have spontaneously developed negative HCV RNA by PCR should continue to be monitored at intervals for the presence of liver disease.

The outcome of chronic hepatitis C virus infection is not well defined. A proportion of patients will ultimately develop cirrhosis and hepatocellular carcinoma.[14-16] However, the proportion of patients at risk for this outcome has not been accurately determined. Various reports have suggested that the lifetime risk of cirrhosis in HCV carriers is between 20-50%. Although several factors have been identified which increase this risk, e.g., alcohol consumption,[17-19] the magnitude of increase in risk has not been well defined. Furthermore, the rate at which disease progresses has also not been completely defined.[20-22] Some studies have indicated that after 17 years of infection the prevalence of cirrhosis is no more than 2%.[23] Other studies have indicated that the mean duration between infection and the first diagnosis of cirrhosis is about 20 years. The differences in these studies are accounted for by referral bias. As a result there is considerable uncertainty about the rate of disease progression.

Patients infected by transfusion are thought to have more aggressive disease, but in this cohort having a transfusion may be a surrogate marker for increased age at acquisition of disease, since the transfused population is considerably older than the average population. The risk of progression to cirrhosis also appears related to the degree of liver inflammation and fibrosis seen at the time of a biopsy. Patients with persistently normal ALT have a lower likelihood of progression to cirrhosis.[19] Co-infection with HIV is associated with higher viral loads, and a more rapid progression to cirrhosis. Co-infection with hepatitis B is associated with a greater risk of HCC than either disease alone.

Once cirrhosis has developed, the 10-year survival is about 80%. However, the rate of development of complications of cirrhosis over the same time period is about 40%.[24]

Transfusion transmitted virus is a recently described virus.[24-25] Its epidemiology and disease associations are unknown. Viremia is common,[26] but there is no known association with liver disease. There are no commercially available kits to assay for this virus. Therefore, no active attempt at diagnosing this infection is required.

Hepatitis is transmitted by percutaneous o r permucosal exposure to infectious blood or blood-derived body fluids. Based on the results of cohort and acute case control studies, risk factors associated with acquiring HCV infection have included transfusion of blood and blood products and transplantation of solid organs from infected donors, injecting drug use, occupational exposure to blood (primarily contaminated needle sticks), birth to an infected mother, sex with an infected partner, and multiple heterosexual partners. Nosocomial and iatrogenic transmission of HCV primarily are recognized in the context of outbreaks, and primarily have resulted from unsafe injection practices. Transmission from HCV-infected health care workers to patients is rare, although a case has been reported of transmission of hepatitis C by a n operating room assistant with a finger injury to three operative patients. Transfusions and transplants have been virtually eliminated as sources for transmission, and most (68%) newly acquired cases of hepatitis are now related to injections.

Hepatitis remains as a significant occupational hazard to all health care professionals especially anaesthetists, surgeons and the operating room assistants. Primary preventive strategies, such as standard precautions and the availability of the hepatitis B vaccine to all

Health care workers, have been instrumental in decreasing the potential for life threatening exposures to HBV, HCV, and HIV. Updated work practices and engineering controls, including the use of safer medical devices and preventive strategies, will continue to further reduce the potential risk of exposures to workers. Ongoing education to health care professionals about the general prevalence, risk of transmission, and availability of prophylaxis and treatment is imperative. Knowledge related to the importance of taking basic precautions through the use of gloves, gowns, and masks has been proven to decrease exposure incidents. Trans-conjunctival spread may be prevented by using eye goggles, and long gum rubber shoes are better than ordinary chappals. Supply of these preventive gears in adequate quantity and at all patient care stations is the responsibility of the hospital administration. A health worker has the right to refuse to attend an infective patient or material, if preventive gear is not provided. Many health professionals are experts in their specialty areas, but are unfamiliar with the latest data related to the prevention and treatment of exposures to blood borne pathogens. Some perceive they are at little risk, and others have untoward fears. They may still hesitate to adopt adequate preventive measures while handling potentially infective patients or materials. Hepatitis B vaccination is now in practice in our hospitals, but lack of necessary documentation has led to missed doses, especially after a staff member is posted to some different unit. At times, all the three doses of vaccine were issued to the staff at the same time. This lead to wastage of at least one or two doses. Entries of having received hepatitis B vaccination need to be entered in the personal medical records and the schedule of next doses must be entered in the movement orders, so that next units could take necessary measures at an appropriate time.[27] Routine testing of all operative patients is yet to be seen. But knowing the state of health practices in our country, and with the knowledge of having detected positive patients postoperatively, it seems prudent to test every patient scheduled for elective surgery for hepatitis B as well as C. Each test will cost the state about three to four hundred rupees. Till hundred percent screening is in practice it is the responsibility of the attending surgeons and the anaesthetists to put specific groups of patients undergoing elective surgery to screening for hepatitis, including those with renal disease, those undergoing haemodialysis, those having received previous blood transfusions, those with history of liver disease, and those from areas known to harbor hepatitis. The use of contaminated syringes by quacks may well lead to unsuspected infection. Thus it is prudent that even emergency patients suspected to be belonging to above-mentioned groups may be screened for hepatitis C.

The hospital practices of contaminated waste disposal needs a lot of effort to be stream lined. The proper disposal of used syringes, the used blood bags, and other soiled material must get some precedence in the top priority list of every hospital administration now. Although the issue has come to limelight in the recent years in our country, the observed efforts seem to lack a thorough understanding of the magnitude of the problem, and the need of integrated networking of the chain of waste disposal starting with the collection from the source. A central level of appreciation, planning and execution can only solve this problem to desirable satisfactory levels.

The cleaning and disinfection of operating rooms needs to be professionally done. It is often left to the sweepers, who have little knowledge of the disease and its spread. The blood soiled floors are often wiped off by the cotton thread sweeps, popularly known as 'pujara'. This may aid in

dissemination of the viral content to clean areas if not thoroughly disinfected. Perhaps use of automatic cleaning / suctioning machines may be useful. Protective gear must be worn by the sweepers to protect them from this dreadful disease. After operating a known patient of hepatitis B or C, the operating rooms must be closed for other cases; and the floor, the operating table, and all other equipment / instruments used must be disinfected through standard procedures. The disposable equipment, including drug filled syringes, anaesthetic tubing and circuits as well as instruments must be packed in polythene bags, sealed, labeled and sent for destruction.

Other prevention strategies that need to be widely implemented include risk reduction counseling and services, and review and improvement of infection control practices in all types of health care settings. Testing for HBs AG and HCV infection should be routinely performed for persons at high risk for infection or who require post exposure management. There are no recommendations for routine restriction of professional activities for HCV-infected health care workers, and persons should not be excluded from work, school, play, and child care or other settings on the basis of their HCV infection status.[28]

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