INTRODUCTION

Viral liver diseases, especially due to hepatitis B virus (HBV) and hepatitis C virus (HCV), were observed with a high frequency in hemodialysis units throughout the world. Due to the deficient immune response of uremic subjects, which renders them unable to eliminate viruses, hemodialysis patients act as reservoirs of the viruses and transmit infection to other patients, to the dialysis unit staff and eventually to their own family, in the case of infection with HBV.

Until 1982, important efforts were directed towards detection and isolation of infected patients, preventing first the spread of HBV and presently the spread of HCV which is a major problem in hemodialysis units in the early 1990s.

Only since the start of active immunization by hepatitis B vaccine in 1982 has a decline in the incidence of HBV infection been observed. At the present time, thanks to extensive vaccination (1), eradication of hepatitis B from dialysis units has been mostly obtained, and protection of health care workers is a fact. The epidemiology of HBV (2) and HCV (3) infection is now clearly identified due to...
HEPATITIS B VIRUS INFECTION

The clinical course of HBV infection in hemodialysis patients is remarkably asymptomatic, without jaundice and with a major risk of chronic progression. This tendency has been attributed to immunodepression due to chronic renal failure. A study of dialysis patients showed that both HBV chronic carriers and patients without evidence of past or present HBV infection had a significant decrease in both absolute number of lymphocytes and functional lymphocytes. There was no significant difference between the number of T lymphocytes in dialysis patients who normally cleared HBV infection as compared with healthy normal subjects, suggesting that the response to HBV may depend on the severity of immunodepression. However, the importance of host factors is outlined by the higher frequency of chronic carriers in males as compared to females, and differences in the major histocompatibility system have been described.

Acute phase of HBV infection

Clinical symptoms of HBV infection can be marked by a preicteric phase with fever, arthralgias and skin rash. These symptoms usually resolve quickly with the onset of icterus and dark urine. With the onset of the icteric phase, symptoms of fatigue and abnormal anorexia typically worsen. Jaundice can last an average of 2 or 3 weeks. In many cases symptoms are lacking and HBV infection can be detected only by unusual asthenia, or by increase in serum transaminases.

The course of a typical case of acute hepatitis B infection is shown in Figure 1. The first serological marker detectable in the serum is HBsAg, which appears during the incubation period and persists in the serum throughout the symptomatic phase of the disease. Concurrently or shortly after the appearance of HBsAg in the serum, HBeAg and HBV DNA are detectable and rapidly increase, being thereafter undetectable within a few days to a few weeks. Indeed, disappearance of these serological markers indicates resolution of viral replication and thus predicts ultimate resolution of the hepatitis. In patients who develop chronic HBV infection, levels of HBV DNA and HBeAg remain high during the acute phase of the illness.

HBcAg is undetectable in the serum but detectable in the liver and is also a marker of viral replication. The first antibody to arise during the course of typical acute hepatitis B is antibody to HBc (anti-HBc). Initially, most of anti-HBc is of the IgM class. The IgM anti-HBc generally persists for only a few months after acute disease, making detection of anti-HBc-IgM a valuable marker for the diagnosis of acute HBV infection. Anti-HBc antibody of the IgG type generally persists for life.

Antibody to HBsAg (anti-HBs) usually appears during convalescence, after clearance of HBsAg. It is considered as a marker of recovery and immunity to HBV. Patients who receive HBV vaccine will have anti-HBs and are protected against infection. Antibody to AgHBe commonly appears with clearance of AgHBe from the serum.

Consecutive to the acute phase of the disease, prospective studies have observed that 5 to 10% of adults can develop chronic liver disease, and the proportion of hemodialysis patients developing chronic HBV infection is approximately 30% (7). A small series of seven patients with acute HBV infection was reported in Spain. The occurrence of chronic liver disease was observed in 4/7 cases.

Chronic HBV infection and hepatocellular carcinoma

Most patients with chronic hepatitis B have no symptoms of liver disease. The most common symptom is fatigue, which tends to be intermittent. Myalgias, arthralgias and transient skin rashes are rare. Physical findings are rare, namely spider angiomata and tender hepatomegaly. Laboratory tests demonstrate increased ALT and AST, fluctuating over time and generally ranging from just above normal to 5-8-fold elevated. In hemodialysis patients the increase of transaminases activity is very mild, and may be absent, even though chronic liver disease can be demonstrated (6-8). The natural history of hepatitis B chronic infection leads to the occurrence of hepatocellular carcinoma. The role of HBV is multifactorial, and in most cases hepatocellular carcinoma is associated with cirrhosis (9-11).

Liver biopsy

Technique

The diagnosis must be assessed on histological examination of the liver, obtained by liver biopsy. The procedure of liver biopsy (12) in hemodialysis patients should be considered, as the risk involved in performing transparietal liver biopsy in these patients is certainly higher than in other patients; all teams have experienced severe complications such as hemoperitonitis or intrahepatic hematomas. Disorders of primary hemostasis, most of which are undetectable in usual tests, are probably responsible for such complications, and therefore the transvenous transjugular approach (13) should be recommended. This technique is safe and provides liver samples of sufficient size when performed in specialized centers. Due to the safety of the method, and to the important discrepancies between biochemical abnormalities and histological findings, liver biopsy should be performed to evaluate histological liver status of hemodialysis patients with HBV or HCV viral