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Viral hepatitis

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Patients with chronic viral hepatitis are often asymptomatic or may have abnormal liver function tests (LFTs). An indication of chronic viral hepatitis is a raised level of alanine transaminase (ALT) and/or aspartate aminotransferase (AST), in the absence of other causes of liver inflammation such as alcohol, non-alcoholic fatty liver disease. Generally, patients with chronic viral hepatitis are followed up 6-12 monthly with blood tests. Six monthly ultrasounds are recommended for surveillance of hepatocellular carcinoma (primary liver cancer) in all patients with cirrhosis, and in some patients with chronic HBV infection in the absence of cirrhosis.

Generally, after recovery from an infection with an organism, a person will develop antibodies to the pathogenic organism. Antibodies to certain infectious diseases can also be produced by vaccination. In these vaccinated people, future blood tests demonstrating the antibodies will indicate past infection or immunisation. Detection of antibodies does not indicate active infection; this is confirmed by detecting the virus in the blood. A person with detectable virus in their blood may or may not manifest symptoms but is potentially infectious and the virus can be transmitted to others.

It is important to understand the distinction between a person who has an active infection (at risk of transmission of infection to others and disease progression) and a person whose antibody results indicate past infection or immunisation to an infectious disease (not an infection risk, and usually not at risk of disease progression). The role of antibody tests in distinguishing between disease status and past infection varies depending on the infection. In some situations, testing for viral nucleic acid (DNA or RNA) is required to determine if actual infection is present.

Hepatitis A

Transmission within families is common. In developing countries, the usual source of infection is faecal contamination of drinking water.The hepatitis A virus (HAV) is detected by two antibody tests:

1. IgM antibody: positive result indicates recent infection.

2. IgG antibody (anti-HA): positive result indicates past infection (previous exposure to HAV) or immunity through vaccination.

Hepatitis B

Most people who are infected with HBV as adolescents or adults do not develop symptoms and clear infection spontaneously - they make a full recovery and are left with immunity for life. However, following acute infection, a small minority (approximately 5%) of patients will progress to a chronic infection.

In contrast, most of the global burden of chronic hepatitis B results from mother to infant transmissions or infection in early childhood, in high prevalence countries. Newborn babies of mothers who have hepatitis B (HBsAg positive) are at risk of infection and should receive HBV vaccination and immunoglobulin (within 12 hours of birth and complete a full HBV vaccination schedule). People who are infected with HBV as infants or in early childhood are often asymptomatic, but usually progress to chronic HBV infection.

There are two categories of tests used to diagnose and manage HBV infection:

1. serological assays: enzyme immunoassay (EIA) detects specific antibody(ies) to HBV and antigen(s) and includes HBsAg, anti-HBs, HBeAg, anti-HBe, anti-HBcAg.

2. molecular assays: detect and/or quantify the amount of viral nucleic acid (HBV DNA [deoxyribonucleic acid]).

Tests are divided into two types:

- qualitative assays: detects presence or absence of HBV DNA
- quantitative assays: measures the amount of HBV DNA ('viral load') in serum (this is the preferred testing method and includes polymerase chain reaction (PCR) and transcription-mediated amplification (TMA) assays).

Antiviral therapy is used to treat patients with HBV infection, with the current aim of treatments to suppress virus replication and prevent progression of liver disease (EASL 2012). Spontaneous clearance of HBV infection may occur without treatment. This is common in adults following acute infection, but can also occur in people with chronic HBV infection. Resolution of HBV infection is rare with current treatment. Resolved HBV infection is defined as 'previous HBV infection without further virologic, biochemical or histological evidence of active virus or disease' (Lok McMahon 2009, p. 4).

Hepatitis C

The majority of patients (60-70%) with acute HCV infection will progress to a chronic infection. Spontaneous viral clearance after acute HCV infection occurs without treatment in 30-40% of people, usually within the first 6 months after infection.There are two categories of tests used to diagnose and manage HCV infection:

1. serological assays: enzyme immunoassay (EIA) detects specific antibody to HCV (anti-HCV)

2. molecular assays: detect and/or quantify the amount of viral nucleic acid (HCV RNA [ribonucleic acid]). Tests are divided into three types:

- qualitative assays: detects presence or absence of HCV RNA
- quantitative assays: measures the amount of HCV RNA ('viral load') in serum. This is usually by polymerase chain reaction (PCR).
- genotype assay: there are 6 main genotypes of HCV. Choice and duration of antiviral treatment, as well as likelihood of response is strongly related to the infecting genotype.

Antiviral therapy is used to treat patients with HCV infection, with the aim of virological cure. Therapy is for a defined time period, usually 24 or 48 weeks. HCV infection is considered to be successfully treated when SVR (sustained virological response) is attained. SVR is defined as the absence of HCV RNA in serum 24 weeks after discontinuing therapy (Ghany et al. 2009, p. 1341).

Hepatitis D

Testing for HDV involves serology for hepatitis D antibodies (anti-HDV). However, this does not allow determination of active infection or prior exposure. Hepatitis D virus RNA testing has only limited availability in research settings.

Hepatitis E

It is endemic in South-East Asia, countries of the Soviet region, India, mid-east Africa and Central America. Large outbreaks are usually spread by contaminated water. Direct person to person spread can occur but is less common. The normal course of infection is an acute and a relatively benign illness. Whereas, HEV in pregnancy can cause fulminant hepatic failure, particularly in the third trimester, with mortality rates of 15-25%.

It was previously thought that HEV is *never* a chronic infection. However, it has been recently recognised that hepatitis E may result in chronic infection, particularly in immunosuppressed individuals such as organ transplant recipients (Kamar et al. 2012, p. 6).

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