Viral Hepatitis

Definition and causal agent

Viral hepatitis refers to infections of the liver caused by a number of viruses including hepatitis A, B, C, E, G, D (due to the delta agent, a defective virus), and epidemic non A. hepatitis. Infections with other viruses such as Epstein-Barr and cytomegalovirus may also cause hepatic disease. Although all these agents can cause occupationally-related infections, by far the most important world-wide occupational risks are from hepatitis B. Infection with hepatitis C and hepatitis A can also be acquired occupationally while other viruses very seldom cause occupational hepatitis.

Causal agent/s:

- Hepatitis A is a non-enveloped RNA virus in the hepatovirus genus of the picornavirus family.
- Hepatitis B virus is a DNA virus from the Hepadnaviridae family (4 serotypes and 7 genotypes of human hepatitis B are known).
- Hepatitis C virus is a RNA virus (6 genotypes and more than 100 subtypes of HCV have been identified).

☐ Hepatitis B and C - Transmission of infection

1. Exposure

In general, hepatitis B and C infection occur in any situation in which the blood of an infected person enters the worker's bloodstream. This usually happens in case of occupational injury, but some cases of infection due to mucous and conjunctive contamination are reported. The capacity of the Hepatitis B virus (HBV) to cause infection is higher than that of Hepatitis C (HCV).

Occupational transmission of HBV

The risk of infection is primarily related to the degree of contact with blood at the work place and also to the antigenic profile (HbeAg) of the source person.

Blood contains the highest HBV titres of all body fluids and is the most important vehicle of transmission in the health care setting.

The likelihood of anti–HBV seroconversion after an accidental percutaneous exposure from an HBV-positive source is between 30% (HBsAg+ - HBeAg-) and 50% (HBsAg+ - HBeAg+). There are data to suggest that the threshold for infection is approximately 10^3 viral particles DNA/mL.

Occupational transmission of HCV

HCV is transmitted through occupational exposures to blood. A single exposure is sufficient to cause the infectious disease but the average incidence of anti–HCV seroconversion in health care workers after accidental percutaneous exposure from an HCV-positive source is relatively low (1,8% - range:0%-7%).

1.1 Occupational Groups at risk

For HBV and HCV infections, groups at risk are primarily those whose occupation brings them into contact with infected blood, blood products, or the body fluids or tissues of infected patients. They include health care workers and laboratory personnel (see Annex I entry nr. 407 ***Other infectious diseases caused by work in disease prevention, health care, domiciliary assistance and other comparable activities for which a risk of infection has been proven***). Other groups at risk are the staff of prisons and mental institutions and police, ambulance and other rescue services.

2. Clinical Disease

2.1 Presenting features

After an incubation period of 30–180 days (HBV) or 15–150 days (HCV), anorexia, nausea and vomiting are followed a few days later by jaundice and the passage of dark urine and pale stools. Diarrhoea, skin rashes and low grade fever can occur in a minority of cases. Clinical examination of the jaundiced patient usually reveals a smooth, tender, enlarged liver.

2.2 Laboratory diagnosis

Confirmed by the presence of high serum aminotransferases and the presence of:

- serum antigen markers (HbsAg, HbeAg) for HBV.
- viral RNA for HVC.

2.3 Prognosis

Hepatitis B is a self-limiting disease in up to 90% of patients. Fulminant (and frequently fatal) hepatitis occurs in less than 1% of patients, but some who recover from the acute phase can develop either a carrier stage (5 to 10%), or a chronic active hepatitis which can lead to liver cirrhosis and hepatocellular carcinoma in up to 30%. About 50% of hepatitis C patients develop a carrier stage, evolving, in 20-30% of cases, into chronic active hepatitis, liver cirrhosis or hepatocellular carcinoma.

3. General criteria for recognizing viral B and C hepatitis

3.1 Determination of causal agent

See section “definition of causal agent”

3.2 Diseases caused

Acute hepatitis

Persistent hepatitis

Chronic active hepatitis

Post-hepatitic cirrhosis

Post-cirrhotic liver cancer

Evidence of the effects of the viruses on hepatocytes (e.g. increase of serum transaminase levels), as sign of activity

Presence in the bloodstream of the appropriate combination of viral antigens, antibodies, DNA/RNA.

Qualitative HCV-RNA for HCV diagnosis.

3.3 Definition of specific criteria for identifying the infectious disease from the type of exposure

Type of occupation

Any occupation involving or likely to involve exposure to blood, blood derivatives, body fluids and biological samples.

Definition of exposure criteria:

Evidence of an episode in which the blood of an infected person could have entered the bloodstream of the worker: injury, contact between infected blood and mucous membrane/conjunctiva. An exposure that might place health care workers at risk for HBV and HCV infection is defined as a percutaneous injury (e.g. a needlestick or cut with a sharp object) or contact of mucous membrane or non-intact skin (e.g. chapped, abraded or affected by dermatitis) with blood, tissue or other potentially infectious fluid. In addition to blood and other blood contaminated body fluids, the following fluids are also considered potentially infectious: cerebrospinal, synovial, pleural, peritoneal, pericardial and amniotic fluids. Semen and vaginal secretions are also considered potentially infectious, even if they have not caused reported occupational infections in Health care workers. Faeces, nasal secretions, saliva, sputum, sweat, tears, urine and vomit are not considered potentially infectious unless they contain blood. In any case, the risk of transmission of HBV and HCV infection from these fluids and materials is low

As a general rule, the risk of infection depends on the viral concentration in the medium (in the case of accidents this may be determined directly) and on host factors, particularly previous immunization.

For acute infection

Minimum induction period: 60 days

Maximum latent period before symptoms: 180 days for hepatitis B; 160 days for hepatitis C.

For chronic infection

Maximum latent period: not determinable.

□ Hepatitis A – transmission of infection

1. Exposure

Faeco-oral transmission

1.2 Occupational Groups at risk

For infection with hepatitis A virus (HAV) individuals at risk are primarily those involved in health care or domiciliary assistance and sewage workers (see disease number 407 "Other infectious diseases caused by work in disease prevention, health care, domiciliary assistance and other comparable activities for which a risk of infection has been proven**").**

2. Clinical Disease

2.1 Presenting features

After an incubation period of 15-45 days (usually 28 days), anorexia, nausea and vomiting are followed a few days later by jaundice and the passage of dark urine and pale stools. Diarrhoea, skin rashes and low grade fever occur in a minority of cases. Clinical examination of the jaundiced patient usually reveals a smooth, tender, enlarged liver.

2.2 Laboratory diagnosis

Evidence of IgM anti HAV during the acute phase of infection.

Evidence of the effects of the viruses on hepatocytes (increase of serum transaminase levels) as a sign of activity. Infection may be asymptomatic or may be clinically manifest across a range of severities from a mild illness lasting 1-2 weeks to a severe disabling disease lasting several months.

2.3 Prognosis

Usually recovery is complete. People usually do not remain infected for life.

3. General criteria for recognizing viral A hepatitis

3.1 Determination of causal agent

See section "definition of causal agent"

3.2 Diseases caused

Acute hepatitis

Definition of specific criteria for identifying the infectious disease from the type of exposure:

Type of occupation

Exposures that might place *workers* at risk for HAV infection include any situation in which faeco-oral transmission can take place, *e.g.* nursing or handling faecal samples in hospital laboratories. Usually, person to person spread is enhanced by poor hygienic conditions, but intra-institutional spread can also occur.

Minimum intensity and duration of exposure: The risk of infection is primarily related to any oral contact with materials contaminated by faecal material derived from an HAV infected source person. Since no HAV carrier conditions have been identified, the transmission of the infection is presumably related to non-epidemic and unapparent clinical infections. Even a single ingestion can cause the disease.

Minimum induction period: 15 days.

Maximum latent period before symptoms: 45 days.