Hepatitis C virus infection

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Introduction

Hepatitis C virus infection (HCV) ranks a close second to chronic alcohol intake as a cause of cirrhosis, end-stage liver failure and hepatocellular carcinoma. It is also the most frequent indication for liver transplantation in Europe and North America. To date, close to 3% of the world population is infected with HCV. While the prevalence of HCV infection ranges between 0.5 and 2% in most western countries, in Canada it is estimated to be 0.8%. HCV is transmitted through contaminated blood, especially as a result of intravenous drug use, as well as from mother to child. In the latter case, the rate of transmission is between 5 and 20% but varies according to the presence or absence of certain co-factors (particularly maternal coinfection with HIV) and/or medical conditions.

Epidemiology

The incidence of HCV infection is higher in 20-30-year-olds, an age group that includes the majority of childbearing women. Extrapolation from the general population data in Canada suggests that one woman out of 120 who gives birth in Canada is infected with HCV. Screening of blood supply is in place since May 1990 (using a first generation test). In 1992, an improved second generation of HCV detection test was introduced, followed by a nucleic acid testing (NAT) in November 1999. Now, blood transfusions are rarely considered a source of contamination with HCV. Residual risk is less than 1 per 100,000 units transfused. The relative epidemiological importance of mother to child HCV transmission will gradually increase and will become the main source of HCV acquisition in newborns. The seroprevalence of HCV in the American paediatric population is 0.2% before the age of 12 years and increases to 0.5% from 12 to 19 years. However, most HCV studies are on children who have received blood transfusions and blood products.

Clinical features

There is limited information on the natural history of the infection acquired by maternal transmission, and it is poorly understood. The illness may be more benign in children. The clinical course in most children is characterized by low

or normal aminotransferase levels in close to 50%–60% of cases, mild hepatic histological changes, and a lower level of viremia detected by RT-PCR. However, cases of hepatic fibrosis are described in children after an evolution of ten years or less. In a variable percentage of cases, children can spontaneously eliminate the virus. Spontaneous clearance appears to be higher in children (25%–40%) than in adults.

HCV laboratory evaluation

Due to the absence or paucity of signs and symptoms of this disease in children, detection of hepatitis C virus infection requires a high index of suspicion in those at risk. There should be routine laboratory evaluation of a child born to an HCV-infected mother; however, only 30% of infected people know about their infected status. As a result, there is an underestimation of the number of infected pregnant women within the population, even though there are identifiable risk factors for the acquisition of HCV. For older children, a history of a major surgery or of having received blood transfusions or blood products before May 1992 requires evaluation. HCV screening should also be performed for all adolescents whose lifestyle is compatible with an HCV contamination risk.

Diagnostic tests

There are two types of tests used in HCV infection evaluation:

1. Tests measuring serum antibodies – an enzyme-linked immunoassay (EIA) and an immunoblot assay obtained through genetic recombination (RIBA).
2. A test detecting the presence of HCV nucleic acid in plasma (PCR).

For the child **18 months of age or younger**, the presence of maternal anti-HCV IgG antibodies in the infant's serum necessitates the use of tests that detect plasmatic viral RNA with the polymerase chain reaction (PCR) techniques. Due to a very low sensitivity in the newborn period, PCR should be performed after four to six weeks of age.

In children of **18 months of age or older**, these tests are diagnostic for current or past infection with HCV, with a sensitivity of 97% and a specificity of 95%. HCV-RNA testing is necessary to confirm active infection.

It is recommended that HCV infected children be referred to tertiary care centres with expertise in pediatric HCV-infection, given the rapid evolution in the approach to management of this disease. The current Canadian guideline and recommendation are that children with HCV infection should **not** be treated outside of a clinical trial.

Hepatitis C virus infection (continued)

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RESOURCES

Quiz

1. **The percentage of the Canadian population infected with the hepatitis C virus is as follows:**

   a) 3%
   b) 2%
   c) 0.8%
   d) 0.4%
   e) 0.1%

2. **Hepatitis C transmission from mother to child is between:**

   a) 60-75%
   b) 40-60%
   c) 25-40%
   d) 5-20%

3. **Diagnosis of HCV infection in children 0-18 months is confirmed by:**

   a) The detection of anti-HCV antibodies confirmed by RIBA
   b) HCV culture
   c) The polymerase chain reaction for plasma viral RNA (PCR-RNA)

4. **The most important risk factor for acquisition of the hepatitis C virus infection is:**

   a) Being a surgeon
   b) Using intravenous drugs
   c) Being in daycare with an HCV-infected child
   d) Being a policeman

5. **Blood donations have been screened since May 1990; the current risk of acquiring HCV infection following a transfusion is:**

   a) < 1 per 10
   b) < 1 per 100
   c) < 1 per 1,000
   d) < 1 per 100,000

Answers: 1-c; 2-d; 3-c; 4-b; 5-d