Hepatitis C in Canada

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Gully and Tepper prepared a concise article on hepatitis C in 1997[1]. An update on the current status of the disease in Canada, based on a recent review by the authors[2] and on new information, is presented here.

It is estimated that approximately 3% of the world's population, or as many as 170 million persons worldwide, are infected with HCV. The virus is a member of the flaviviridae family with a genome of single-stranded RNA. Various genotypes exist in different regions of the world. So far, six major genotypes have been isolated: genotypes 1-3 have been described worldwide, genotypes 4 and 5 principally in Africa, and genotype 6 primarily in Asia. In Canada, the major genotypes are 1, 2, and 3, although genotype 1 is predominant.

A key feature of HCV infection is the high frequency (75% to 85%) with which acute infection progresses to chronic infection. Available studies of hepatitis C infection have shown that the disease has a protracted course and serious sequelae may not appear until decades after initial infection. Infection by HCV does not seem to induce a protective humoral response, but it is becoming clear that some infected individuals do recover from their infection.

Hepatitis C is transmitted through blood or body fluids contaminated with the virus. The most important risk factor associated with transmission of HCV is the sharing of drug injection equipment. Vertical and sexual transmission can occur but are inefficient. Inapparent parenteral exposure, such as tattooing, body piercing, and sharing of personal hygiene items, are presumed to be risk factors only if the instruments or items for such activities are contaminated with blood or body fluids. Although historically important, the risk associated with blood transfusion and the use of blood products has been markedly reduced in most developed countries through screening of blood donations.

Hepatitis C prevalence

In Canada, reporting of hepatitis C started in British Columbia in 1992, and gradually more provinces began to report the disease (data source: Division of Surveillance, Health Canada). Although there has been an exponential increase in the number of reported cases over time, this is primarily a result of increasing recognition and reporting of remotely acquired cases as opposed to an epidemic of new infections[2].

It has been estimated that the prevalence of anti-HCV positivity is approximately 0.8% (0.68% to 0.94%) in Canada, 0.96% in males and 0.53% in females[3]. According to seropositivity rates for first time blood donors in 1997 (Canadian Red Cross: unpublished data), there are evident differences among the provinces, B.C. having the highest seropositive rate (0.274%) and Newfoundland the lowest (0.0%).

The prevalence of HCV infection is much higher in certain at-risk population groups in Canada. For example, Strathdee et al[4] showed that 88% of 1,006 injection drug users in

Vancouver who had injected illicit drugs in the previous month were positive for anti-HCV. Inmates in prisons were found to have anti-HCV positive rates in the range of 28% to 40%[5,6]. A study of 437 street youth in Montreal indicated a prevalence of 12.6% (Roy et al, Hepatitis B and C among street youth in Montreal - final report, 1997) whereas another study of street youth in Ottawa showed a lower prevalence, of 4%[7]. Finally, in a northern Alberta dialysis population, the prevalence of hepatitis C infection was 6.5%[8].

According to data from the enhanced sentinel health unit surveillance in Edmonton, Calgary, Winnipeg, and Ottawa-Carleton in 1998-1999, the incidence rate of clinically recognized acute hepatitis C (with symptoms, elevated levels of liver enzymes, and positive anti-HCV test results) was 2.9 per 100,000 person years[9]. Males had higher incidence rates than females except in the 15-29 age group. The incidence of acute hepatitis C peaked at 30-39 years of age for males and 15-29 years for females.

Risk factors

A few Canadian studies have looked at transmission patterns and risk factors for hepatitis C. In a report by Scully et al[10] of a series of 63 consecutive patients, 43% of infections could be attributed to injection drug use (IDU) and 33% to blood use. Among 54 cases reported in Prince Edward Island from 1991 to 1995 and followed up by the Chief Medical Officer of Health, 46% were attributed to IDU, 39% to blood use, and 6% to both; for 9% a risk factor was not identified[11]. In the Capital Regional District, B.C., of 698 anti-HCV positive cases in the general population reported to the public health department in 1995 and 1996, 69.6% admitted to IDU and 16% to receipt of blood (Health Canada, unpublished data).

Enhanced surveillance in the four health units in 1998-1999 identified 102 acute cases of hepatitis C, of which 72 (71%) were asked about a history of risk factors during the 6 months before the onset of the disease[9]. Of the 57 acute hepatitis C cases reporting one or more risk factors, 36 (63%) revealed a history of IDU, among whom 28 (78%) reported sharing needles. Sex with HCV-infected individuals was identified as a risk factor for only 3.5% (2/57) of cases. Clearly, IDU is the single most important route of HCV transmission currently in Canada, accounting for at least 60% of all HCV transmissions.

Prevention and control

Modelling of the estimated increase in the burden of sequelae specifically related to HCV in Canada between 1998 and 2008 predicts that the number of prevalent cirrhosis cases will almost double (increasing by 92%); the number of prevalent cases of liver failure and hepatocellular carcinoma will increase by 126% and 102% respectively; and the number of liver deaths will increase by 126%[12]. These results highlight the importance of the control of disease progression in HCV-infected persons in addition to the primary prevention of hepatitis C infections in this country.

Prevention and control of hepatitis C involves prevention of HCV infection, slowing disease progression, and reducing the likelihood of premature death. In October 1998, Health Canada held a national consensus conference in Ottawa: *Hepatitis C - Prevention and Control: A Public Health Consensus,* and a report was published[13] that provides a general guide for activities to be used in the prevention and control of hepatitis C.

No vaccine has as yet been developed for this infection; hence, prevention relies primarily on the successful interruption of viral transmission. This mainly involves preventing very high-risk behaviours, such as the sharing of needles and other IDU gear. Prevention of transmission from blood or blood components, organs, tissues, or semen and through unsafe medical or health care practices and contaminated personal hygiene items is also important.

Efforts should be made on different fronts to reduce the transmission of HCV and other bloodborne pathogens among injection drug users[13]. These include prevention of initiation, harm reduction among illicit drug users, programs targeting special population groups at higher risk for IDU and hepatitis C, such as street youth, and research to explore new ways to contain the spread of HCV through illicit drug use.

Although the risk associated with blood, blood components and blood products is currently very low (< 1/100,000), ensuring the highest safety possible of these products is essential. Guidelines have been prepared for nosocomial, occupational, and other inapparent parenteral transmission routes of HCV[14-18]. Counseling of anti-HCV positive persons to prevent further transmission is another component of primary prevention. HCV-infected women of childbearing age should be informed that there is a risk of transmission to any infants born, that the risk increases if a woman is infected with both HIV and HCV, and that the infants should be tested for infection and managed appropriately[13]. HCV-infected persons should not share their personal hygiene items. Household contacts should take "common sense measures" to protect themselves from exposure to the blood of an HCV-infected person. Although the risk may be low, HCV can be transmitted through sexual activities, especially with risky

sexual behaviours such as unprotected sex with multiple partners.

Prevention of disease progression and management of hepatitis C cases include reduction of consumption of alcohol, consideration of vaccination against other hepatitis viruses such as HAV, and treatment with interferon and ribavirin. The CASL has prepared a guideline for the clinical management of hepatitis C cases[19].

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