ABSTRACT

Introduction: The prevalence of hepatitis C in Canada is not known. There is limited information on most small area populations such as Prince Edward Island.

Methods: A retrospective approach was used to obtain detailed information on all cases of hepatitis C identified in Prince Edward Island from December 1990 to September 1995. Cases were reviewed for demographic, clinical and risk factor information, including blood donation and transfusion histories.

Results: There were 54 RIBA confirmed cases of hepatitis C infection included in the Prince Edward Island Hepatitis C Database, of which 38 (70%) were males. Age ranged from 18 to 76 years, with a mean age of 38 years. Twenty-eight (52%) of the cases had a history of injection drug use, and 24 (44%) had received blood or blood products in the past. There were five cases with neither of these risk factors identified.

Discussion: The results suggest that, in this small, primarily rural population, injection drug use is the most common means of hepatitis C transmission, followed by receipt of blood or blood products.

ABRÉGÉ

Introduction : On ignore quelle est la prévalence de l'hépatite C au Canada. On dispose de peu de renseignements sur la plupart des populations occupant un territoire restreint, telle celle de l'Île-du-Prince-Édouard.

Méthodes : On a entrepris un programme de surveillance de l'hépatite C dans l'Île-du-Prince-Édouard afin de recueillir des renseignements sur tous les cas répertoriés dans cette province entre décembre 1990 et septembre 1995. On a examiné les dossiers de chaque cas afin de noter les informations démographiques et cliniques ainsi que les facteurs de risque, incluant les antécédents d'usage de drogues injectables et 24 (44 %) ont déjà reçu du sang ou des produits sanguins. On note cinq cas où aucun de ces facteurs de risque n'a été observé.

Résultats : On a répertorié 54 cas d'infection par le virus de l'hépatite C, confirmés par RIBA, dans la base de données sur l'hépatite C de l'Île-du-Prince-Édouard, dont 38 (70 %) sont de sexe masculin. L'âge varie de 18 à 76 ans et l'âge moyen est de 38 ans. Vingt-huit (52 %) des cas ont des antécédents d'usage de drogues injectables et 24 (44 %) ont déjà reçu du sang ou des produits sanguins. On note cinq cas où aucun de ces facteurs de risque n'a été observé.

Discussion : D'après les résultats, dans cette population restreinte et principalement rurale, l'usage de drogues injectables est le mode de transmission de l'hépatite C le plus courant, suivi de la transfusion de sang ou de produits sanguins.

Hepatitis C in Prince Edward Island: A Descriptive Review of Reported Cases, 1990 -1995

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Although the population prevalence of hepatitis C in Canada is not known, studies in defined populations have provided some information about the epidemiology of hepatitis C. In the United States, prevalence in blood donors is between 0.3 and 0.7%,¹ and is probably slightly higher in the unscreened general population.²⁻³ For Canada, recent figures indicate that about 0.04% of blood donors are anti-HCV positive at the time of screening.⁴

The major route of transmission for hepatitis C is parenteral, with injection drug use being the most significant risk factor for infection.^{1,2,5,6} For Canadian populations, estimates of seroprevalence in injection drug users range from 45 to 52%, and in prison populations, from 27 to 39%.⁷⁻¹¹

Receipt of blood or blood products not screened for hepatitis C antibody is a well-documented risk factor.⁶ The risk of transfusion-associated hepatitis C infection in Canada has declined since 1983; prior to the introduction of any screening for hepatitis C, about 4.5% of transfusion recipients became infected. With the introduction of specific anti-HCV testing, the incidence of post-transfusion hepatitis C fell to 1.1%, and has continued to decline.¹² A recent survey of Canadian

hemophiliacs indicates an overall seroprevalence of 63%.¹³

Preliminary findings from the Sentinel Health Unit Surveillance System (SHUSS) have provided additional information on the risk factors for hepatitis C infection in the Canadian population. SHUSS is a network of Canadian health units, representing a mix of urban and rural communities and including about 10% of the Canadian population. Eight of these sites have been engaged in active laboratory-based surveillance for hepatitis A, B and C.¹⁴ From 578 reports of persons identified for the first time to be hepatitis C antibody positive, 57% had a history of injection drug use, 14% reported past blood transfusion, and 14% had both of these factors recorded.¹⁵

A study in Prince Edward Island was recently undertaken to obtain information on all hepatitis C cases identified in the province between December 1990 and September 1995. Cases were reviewed for demographic, clinical and risk factor information, including history of receipt of blood or blood products. Blood donation histories were also collected.

METHODS

Cases were from the Prince Edward Island population, which numbers approximately 130,000 people. A case was defined as any resident of the province ever diagnosed with radio-immunoassay (RIBA) confirmed hepatitis C, regardless of current clinical status. Three generations of these confirmatory tests (RIBA-I, RIBA-II and RIBA-III) were in use between 1990 and 1995, but the RIBA-I test has been replaced by the more sensitive and specific RIBA-II and RIBA-III tests.^{2,16-18} Whichever confirmatory test was in use at

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the time of testing was deemed acceptable for this study. Confirmatory testing for hepatitis C was performed at the Laboratory Centre for Disease Control (LCDC) in Ottawa until July 1994. Since that time, testing has been carried out at the Victoria General Hospital in Halifax.

A standard questionnaire was developed for the study, which included questions on age and sex, hepatitis C antibody status and hepatitis B surface antigen status. In addition, there were questions relating to liver function, liver biopsy results and history of acute illness indicative of hepatitis. A large portion of the questionnaire dealt with possible risk factors and exposure history. History of blood donation, transfusion, haemodialysis and other medical procedures was obtained. Risk factor information related to lifestyle practices was sought, including that relating to injection drug use, sexual history, tattooing and body piercing. Copies of the questionnaire are available on request.

From April to September 1995, data were collected for all cases ever diagnosed in the province. Although hepatitis C was not reportable in Prince Edward Island until January 1991, all cases diagnosed from December 1990 onwards were included in the study.

The Chief Health Officer, on the authority of the Public Health Act, contacted the attending physician for each case, and the history was obtained from either the physician or the case. Where additional information was required, there were a number of sources, including physicians, laboratories, and health departments in other provinces. Data previously collected from the SHUSS study was used as well, as this system had demographic and risk factor information on a number of cases in the province.

All interviews were carried out by the principal investigator or the study coordinator, using the standard questionnaire. Individual consents were obtained from cases in order to obtain and review their medical records for blood transfusion histories. The information collected on blood donation and transfusion was used by the Canadian Red Cross to initiate lookback and traceback procedures.

Analysis of results was carried out by the field epidemiologist and the Chief of the

TABLE I
Characteristics of Hepatitis C Cases by Category of Risk

Category of Risk	Male	Female	Total	Median Age*	Age Range*
Injection drug use (IDU)	20	5	25	35	19-47
Receipt of blood/blood products	11	10	21	37	18-76
IDU and receipt of blood/blood products	3	-	3	34	34-40
Risk not identified	4	1	5	36	18-39
Total	38	16	54	36	18-76

* age at date of RIBA test

TABLE II
Reason Given for Testing, by Category of Risk

Category of Risk	Reason Given for Test
Injection drug use (IDU)	10 - high risk behaviour 7 - symptomatic 5 - abnormal liver function 2 - blood donor screen 1 - follow-up contact tracing
Receipt of blood or blood products	7 - symptomatic 7 - hemophiliac 3 - blood recipient tested at own request 2 - abnormal liver function 1 - medical evaluation 1 - blood donor screen
IDU and receipt of blood or blood products	1 - high risk behaviour 1 - blood donor screen 1 - hemophiliac and high risk behaviour
Risk not identified	2 - blood donor screen 1 - medical evaluation 1 - abnormal liver function 1 - symptomatic

Blood-borne Pathogens Division, Bureau of Infectious Diseases, LCDC. The non-nominal information was compiled into a database for descriptive analysis, using Epi-info Version 6 (CDC, Atlanta, Ga. 1994).

RESULTS

There were 54 RIBA confirmed cases of hepatitis C infection reported in the Prince Edward Island Hepatitis C Database. Fifty-two cases (96%) were confirmed by second or third generation RIBA tests, and the remaining two cases were RIBA-I confirmed, both in 1991. There were 38 males and 16 females, and ages ranged from 18 to 76 years, with a median age of 36 years and a mean age of 38 years. Fifty-two of the cases were alive at the time of the study, one was dead, and the status of one case was not available at the time of the study. Complete data were not obtained for all cases, particularly in the areas of clinical information, including symptoms, liver function tests, and biopsy results.

Two major risk factors were identified in this group: injection drug use and receipt of blood or blood products. Twenty-eight (52%) of the cases had a history of injection drug use, and 24 cases (44%) had received blood or blood products in the past. These figures include three people with both of the risk factors reported. There were five cases (9%) with neither of these risk factors identified. Figure 1 shows the percentage distribution of individual cases by the category of risk, and Table I outlines some of the demographic data for the cases. The cases with both injection drug use and receipt of blood or blood products have been assigned a separate category of risk.

Of all 28 cases with injection drug use histories, 10 (36%) reported use within the past year, and extending back at least 10 years. Sharing of needles was reported by 16 users (57%). Heavy alcohol use was frequently noted in this category as well, as 16 cases (57%) reported current or past alcohol abuse (self-defined).

Of the 24 cases with histories of receipt of either blood or blood products, 17 (71%) recalled such events. The remainder did not recall specific events, but chart reviews showed that blood or blood prod-

ucts had been received in the past. Most had received blood transfusions between 1961 and 1988, but two had received blood as recently as 1992. Five cases had received multiple transfusions over a period of years. Nine hemophiliacs are included in this group, and all had received coagulation products in the past. Eight of the hemophiliacs were known to have been transfused with other blood products in the past.

There were five cases (9%) for whom neither injection drug use nor receipt of blood or blood products could be identified as risk factors, and these cases had no history of surgery or haemodialysis. Possible other risk factors in these cases included extensive travel in hepatitis C endemic areas, household and sexual contact with a known hepatitis C case, and a case with a history strongly suggestive of injection drug use (although this was denied). There were no indications of occupational risk in this group. There were no reported exposures to other possible risk factors such as tattooing or body piercing, but information on these two exposures was incomplete for some of the cases.

Table II outlines the reasons given for testing, which have been assigned to categories for analysis. For example, the cases that listed tiredness, fatigue, weakness or jaundice were placed in the "symptomatic" group.

DISCUSSION

More than half of the cases (52%) had a history of injection drug use, and almost half (44%) had a history of receipt of blood or blood products. However, there was differential case ascertainment by risk group, as many of the hemophiliacs in the province had been screened for hepatitis C infection, but injection drug users were found primarily as a result of testing on entering treatment or correctional facilities. If all of the hemophiliac cases are removed from the database, the percent of blood or blood product-related cases drops to 33%, and the proportion of injection drug use cases increases to 60%.

Injection drug use remains the most significant risk factor for infection, a finding consistent with other studies.^{1,6,13,19-21}

However, Canadian studies have referred to urban populations or to groups in correctional facilities,^{8,9,10} and two thirds of this population are rural-based. Although some of the injection drug users had lived in urban areas outside the province, it is clear that transmission of virus by injection drug use is not a problem unique to populations in urban areas.

For the 13 cases with a history of blood transfusion and no history of injection drug use or hemophilia, dates of transfusion were all previous to the onset of testing of blood for hepatitis C markers, with the exception of one case, where other risk factors could not be ruled out.

Up to 80% of hepatitis C infected people will experience persistent infection, and most will also develop chronic persistent or chronic active hepatitis.³ Almost half of the cases on the database were tested because they were symptomatic or as a follow-up for abnormal liver function test results, indicating some degree of active illness. Two thirds of all cases in this study characterized themselves as current or past alcohol abusers, and as alcohol consumption is a cofactor for the development of cirrhosis in persons with hepatitis C infection,² the burden of illness associated with these cases is likely to increase in time.

Only three cases (5%) requested hepatitis C testing, and these individuals were all transfusion recipients, although a further eight (15%) were advised to be tested because of hemophilia. Twenty percent of all cases gave "high risk behaviour" as the reason for testing, but these were predominantly individuals who were tested as part of the medical evaluation on admission to an addiction treatment facility. The remaining cases (46%) were tested for medical indications.

Six cases (11%) were discovered as a result of blood donor screening, and three of them had injection drug use histories. It has been noted that some injection drug users continue to donate blood, despite measures in place allowing for self-deferral.^{22,23} In this study, at least one of the six cases discovered as a result of donor screening had used injection drugs within a year before giving blood, but it is not known whether this was indicated on the donor questionnaire at the time of donation.

This study required considerable time and effort to collect the necessary information from various sources. In particular, when information on blood transfusion and donation history was needed, there were several procedures to complete before the information could be released. Any control programs that attempt to track cases and obtain risk factor information will require similar and resource commitments.

CONCLUSION

For a group of 54 persons with hepatitis C in Prince Edward Island, injection drug use is the most prominent means of transmission, followed by receipt of blood or blood products. These results have been used to develop general education programs, one for physicians and other health care workers and one for the public, as recommended in the 1994 Guidelines and Recommendations on the Prevention and Control of Hepatitis C.³ In addition, newly reported cases of hepatitis C in the province continue to be offered individual follow-up by the public health department, and this includes initiation of lookback and traceback procedures where appropriate.

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