Improving the survival of HIV-HCV co-infected people in Canada

25 June 2012

The widespread availability of potent combination anti-HIV therapy, commonly called ART or HAART, has tremendously improved the health of HIV-positive people. Researchers in high-income countries increasingly expect that a person who is diagnosed and treated in the present era will likely have a near-normal lifespan.

However, many HIV-positive people (and people at high risk for HIV infection) have other, often pre-existing health issues that need additional attention, including the following:

- smoking tobacco
- depression, anxiety, post-traumatic stress disorder and other mental health issues
- addiction to alcohol and other substances
- co-infection with liver-damaging viruses such as hepatitis B and C viruses

If these other health issues are not addressed, the likelihood of increased survival arising from ART may not occur.

Hepatitis C virus co-infection

Hepatitis C virus (HCV) infects and damages the liver. Over time, the struggle between the immune system and HCV results in inflammation, which affects a greater part of the liver. Healthy liver tissue is gradually replaced with useless scar tissue—a process called fibrosis. As fibrosis spreads through the liver, this organ becomes more dysfunctional and complications occur. Eventually, severe liver damage appears, and in some cases, liver cancer. HIV infection accelerates the pace of HCV-related liver damage.

Researchers at McGill University in Montreal began a study in 2003 to assess the health of people co-infected with HIV and HCV. In 2007 they began to expand the study to include other research groups, and as of 2012 a total of 18 clinics in the following provinces have joined the study:

- Alberta
- British Columbia
- Nova Scotia
- Ontario
- Quebec
- Saskatchewan

More than 1,000 co-infected participants have been enrolled in what is now called the Canadian Co-infection Cohort Study (CCC).

The CCC team recently published an analysis of its findings. The researchers found very high rates of liver injury, substance use and death among participants. They estimate that 50% of these deaths may have been preventable and suggest interventions to improve the health and survival of co-infected people.

Study details

As of June 2012, 1,105 adults have been enrolled in CCC and 105 have died (Marina Klein MD, personal communication). Upon entering the study, all participants are interviewed and blood samples are drawn for analysis.
Additional data are extracted from participants’ medical records. Visits to the study clinic are repeated about every six months.

To estimate the degree of liver fibrosis in participants in a non-invasive manner, the research team used a formula called APRI: the aspartate amino transferase (AST; a liver enzyme) to platelet ratio index. The formula is as follows:

- 100 multiplied by (the AST value, divided by upper limit of normal for AST), all divided by the platelet count.

Participants with an APRI score greater than 1.5 were considered to have significant fibrosis.

The average profile of participants when they entered the study was as follows:

- 73% men, 26% women, 1% transgendered
- age - 45 years
- 90% were born in Canada
- 13% were of Aboriginal ethnicity
- length of HIV infection - 12 years
- current CD4+ count - 372 cells
- 82% were taking ART; 75% of those taking ART had an HIV viral load less than 50 copies/ml
- length of HCV infection - 19 years
- common strains of HCV were: genotype 1 - 73%; genotype 2 - 5%; genotype 3 - 20%; genotype 4 (3%)
- 20% had an APRI of 1.5 or more, suggestive of a significant degree of liver damage

Results

Researchers described the participants as being “socially disadvantaged”; for instance, the following features were relatively common:

- 81% had a history of injecting street drugs (38% currently injected street drugs)
- 76% had a monthly income of less than $1,500
- 57% had previously been imprisoned
- 44% had been diagnosed with a mental health issue
- 31% disclosed that they drank hazardous amounts of alcohol

Most participants smoked tobacco (77%) and most (70%) had not received treatment for HCV.

About End Stage Liver Disease (ESLD)

A consequence of the cumulative liver damage from HCV infection is that over time this organ becomes increasingly dysfunctional. Without HCV treatment, the health of the liver degrades so that it eventually stops working. The final phase of HCV-related liver disease is called ESLD. Symptoms of ESLD can include the following:

- lack of energy
- nausea
- loss of appetite
- swelling of the abdomen due to the buildup of fluid
- bleeding in the gastrointestinal tract
- disturbances in thinking and memory due to the accumulation of neurotoxins in the blood
- recurrent bacterial infections

In some cases of ESLD, liver cancer can also occur.

None of the participants with ESLD received a liver transplant.

Survival

Rates of death among participants in the study were generally much greater than in Canadians of a similar age who had HCV but were not co-infected. The survival of women was particularly poor in the study, with women having a
rate of death double that of men in the study.

The issue of high rates of death in co-infected people is not restricted to Canada. Studies in France and the U.S. also suggest that co-infected people are at heightened risk of death.

Common causes of death in the CCC were as follows:

- ESLD – 29%
- drug overdose – 24%
- cancer – 10%
- AIDS-related infections – 5%
- other causes (including violence, accidents and overwhelming bacterial infections) – 18%

Note that figures do not total 100% because in 11 cases doctors were not able to pinpoint a cause of death.

**Aboriginal people**

People of Aboriginal ethnicity comprise about 4% of the Canadian population but 8% of the Canadian population living with HIV. In the present study, 15% of co-infected people were of Aboriginal ethnicity, many of whom were women. These figures underscore the vulnerabilities of Aboriginal people in Canada to infection with HIV and HCV.

**Overcoming multiple vulnerabilities**

According to the study team, participants in the study have “extremely high rates of social instability, poverty, mental illness and alcohol and drug use.” These multiple vulnerabilities provide both challenges and opportunities for improving the health of people co-infected with HIV and HCV. Despite the challenges faced by the study population, the “vast majority of participants were able to take and respond well to ART. As a result, they did not develop AIDS-related illnesses. This underscores the fact that co-infected people can and are engaged with their health and the health care system and can benefit from such engagement,” says Dr. Marina Klein.

To address the challenging situation among co-infected people in Canada, the research team makes the following recommendations:

- improve adherence to ART
- increase the number of co-infected people who receive treatment for HCV infection

In order for this to occur, the researchers call for “increasing access to multidisciplinary teams to support entry and adherence to HIV and HCV treatment.”

The team also recommends to “enhance existing harm reduction practices, including access to sterile injection equipment through syringe exchange programs, supervised injection sites and opiate substitution therapy.” The researchers note that these steps “have been demonstrated to be beneficial in preventing death from drug overdose, preventing HIV progression and reducing transmission risks for HIV and HCV.”

The research team warns that Canada is likely to be faced with growing cases of ESLD in the years ahead due to the large number of people with HIV-HCV co-infection. The cost of managing such cases will be high. As with many health conditions, it is cheaper to invest in ways to prevent ESLD (and, ideally, prevent HIV and HCV infections) rather than wait until costly hospitalization is required.

The CCC is a valuable project that has revealed the complex care needs of co-infected people. Future research projects using the data captured by the CCC could also be done to help clinics and health organizations “better target” treatment and preventive services to co-infected people so that their burden of illness can be reduced.

**Resources**

[Canadian Co-infection Cohort](http://www.hepCinfo.ca)

[CATIE’s hepatitis C site](http://www.hepCinfo.ca)

[Living with HIV and Hepatitis C Co-infection](http://www.hepCinfo.ca)
Acknowledgement

We thank Marina Klein, MD, from McGill University, for research assistance, helpful discussion and expert review.

—Sean R. Hosein

REFERENCES:


Disclaimer

Decisions about particular medical treatments should always be made in consultation with a qualified medical practitioner knowledgeable about HIV- and hepatitis C-related illness and the treatments in question.

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Production of this content has been made possible through a financial contribution from the Public Health Agency of Canada.

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