Why Conduct A Study On Acute HIV Infection?

CIHR Team in the Study of Acute HIV Infection in Gay Men

Early Recognition and Rapid Response to HIV Status

604.707.5600 | acutehivstudy@bccdc.ca | www.acutehivstudy.com

What is acute HIV infection (AHI)?

Acute HIV infection (AHI) is the first stage of HIV infection. This stage begins when a person becomes first infected with HIV, and lasts for about two months. During this period, the amount of HIV (number of copies of HIV, or HIV "viral load") in the blood, semen, and other body fluids gets very high. In the first month after our bodies are first exposed to HIV, many (but not all) people experience seroconversion symptoms, which are very similar to having the flu. These symptoms include fever, rash, muscle aches, and swollen glands.

Why is acute HIV infection important?

A higher amount of HIV in blood, semen and bodily fluids means that there is a greater chance of passing HIV on to sexual partners and people with whom one is sharing injection drug equipment. This means that people in the acute stage of HIV infection have a very high chance of passing HIV on to their partners, which then decreases as the viral load drops. Researchers estimate that as many as 50% of new HIV infections may result by transmission of HIV from someone in the acute stage of HIV infection (see Figure 1).

Most people who find out they are infected with HIV take steps to lower the chance of passing HIV to someone else (such as using condoms, or having less sex). When people find out they have HIV while they are in the acute stage of infection and adopt safer sex measures, fewer people will be exposed to HIV during this highly infectious period. This is one of the main reasons why researchers around the globe are studying the acute stage of HIV infection and the role it plays in HIV epidemics.

How is HIV detected during acute HIV infection?

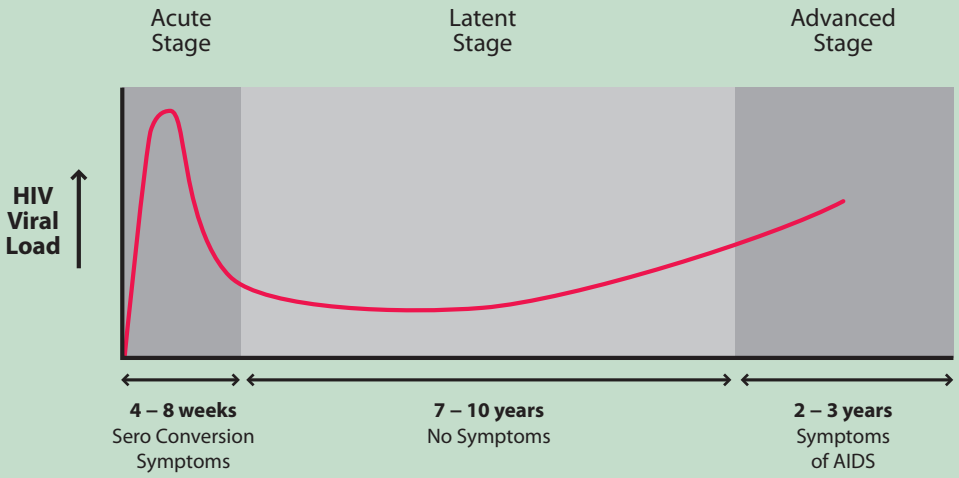
Diagnosing acute HIV infection is challenging, because tests cannot detect the virus immediately following infection. The time between infection and when HIV tests can detect the virus is known as a test's "window period".

HIV tests look for different markers of the virus. The first marker that appears in our blood following HIV infection is the genetic material of HIV itself, RNA, which appears within one week. The second marker, an HIV protein (called the p24 protein) appears within approximately two weeks. Antibodies, which are our body's immune response to HIV, are the third marker and appear between two and three weeks after infection.

The most common HIV tests look for HIV antibodies, including point-of-care or rapid HIV tests. HIV antibody tests can diagnose people in the acute stage of infection, but some people with acute infection will be missed. Tests which look for HIV RNA have the shortest window period and are most likely to detect people during the period of acute HIV infection (see Figure 2).

RNA tests can be done on a sample from one person, with an average window period of 7-10 days. However, to save costs, RNA testing is often done using a technology called pooling, which pools together multiple specimens, and tests each pool for HIV RNA. This is called pooled NAAT (nucleic acid amplification testing), or commonly called the "early HIV test". The early HIV test has an average window period of 10-12 days.

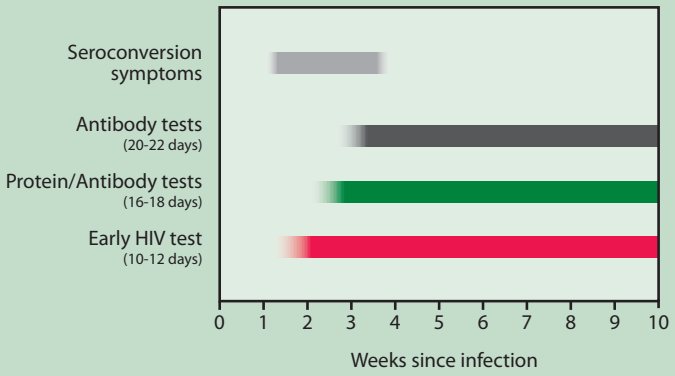
FIGURE 1: HIV VIRAL LOAD BY TIME SINCE FIRST INFECTED WITH HIV



Note: This graph shows the natural history of HIV infection, without treatment. When a person with HIV takes HIV treatment (called highly active antiretroviral therapy, or "HAART"), the HIV viral load drops to very low, often undetectable levels, without progression to the advanced stage of HIV infection.

Researchers estimate that as many as 50% of new HIV infections may result by transmission of HIV from someone in the acute stage of HIV infection.

FIGURE 2: WINDOW PERIODS OF DIFFERENT TESTS DURING ACUTE HIV INFECTION



Bars show when after infection a test will give a positive result (Window periods of different tests in brackets)

What was our intervention?

Starting in April 2009, the BC Public Health Microbiology Reference Laboratory in collaboration with the BC Centre for Disease Control and other research partners, began a pilot study of early HIV testing at 6 clinics accessed by gay and bisexual men in Vancouver. Two social marketing campaigns were developed by one of our community partners, a community gay men's health agency, Health Initiative for Men (HIM), to promote awareness of the early HIV test and educate about the nature of acute HIV. All individuals who were diagnosed with acute infection were offered professional counseling and linked to primary care as necessary.

We asked men diagnosed with acute or recent infection to participate in our research study, and enrolled a cohort of 25 newly diagnosed HIV positive men. In addition, we enrolled a second cohort involving 166 gay men who were known to be HIV negative. We followed both of these cohorts for one year or longer.

Why did we form the CIHR Team in the Study of Acute HIV Infection in Gay Men?

Our study team was established in 2008 to investigate the impact of introducing the early HIV test on the HIV epidemic among gay men in Vancouver. We wanted to know if increasing our ability to detect acute HIV infection would lead to earlier diagnosis, behaviour change, and fewer HIV transmissions. We set out to research the impact of new testing technologies at multiple levels, including for laboratory staff, clinicians, public health practitioners, gay men themselves, and on the population of gay men overall. We used multiple methods of data collection, including analysis of laboratory and testing data, and surveys and interviews with gay men newly diagnosed with acute or recent HIV infection, as well as HIV negative men.

Why did we focus on gay men?

Gay men were the population first affected by HIV in BC and remain heavily affected today. In 2011, gay, bisexual and other men who have sex with men were estimated to make up 56% of all new HIV infections and 45% of all people living with HIV in BC, which mirrors trends in many other places in North America and Europe. Based on previous research we also know that gay, bisexual and other men who have sex with men were more likely to be diagnosed with acute HIV infection in BC. We believe it is critically important to understand the role of acute HIV infection in sustaining the current HIV epidemic among gay men, in order to reverse these trends.