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**Studies investigate presence of hepatitis C virus among gay and bisexual men**

*By Sean Hosein*

Hepatitis C virus (HCV) can infect the liver, causing inflammation that injures this organ. If HCV is left untreated, injury can spread throughout the liver and this organ consequently becomes increasingly dysfunctional. As a result, the eventual appearance of serious symptoms related to liver damage occurs and a person’s quality of life degrades. HCV infection also increases the risk for liver cancer.

**The spread of HCV**

HCV (and other germs) can be spread in a number of ways, including:

**Transfusions, blood products**

In Canada and other high-income countries today, the spread of HCV by transfusions of blood or platelets or by use of clotting factor is extremely rare. This safety arises from screening of the blood supply for HCV, implemented in the 1990s.

However, in some other countries the blood supply may not have been screened so immigrants to Canada may have inadvertently been infected in their country of origin, as might Canadians who received transfusions abroad.

**Unsterilized medical equipment**

In high-income countries, medical equipment that is meant for reuse is sterilized, so HCV infection via this route is extremely unlikely. This is not always the case in other parts of the world.

Another source of HCV infection may be the reuse of needles and syringes in mass treatment or mass vaccination campaigns in other countries. Again, this is not an issue in Canada today.

**Vertical transmission**

Researchers estimate that the risk of transmission from infected mother to infant is between 4% and 7% and higher when the mother is co-infected with HIV.

**Substance use**

Sharing equipment for injecting street drugs is the major source of new HCV infections in high-income countries today. This includes needles, syringes, cookers and other equipment for injecting. HCV infection can also be spread from sharing straws and rolled-up currency notes used to inhale powders or crystals, and pipes used for smoking crack.

**Sex**

HCV can be spread through condomless vaginal sex among heterosexual people. However, among monogamous HIV-negative couples, sexual transmission of HCV is highly unusual, even when condoms are not used.

Further research is required with heterosexual women, both HIV positive and negative, to assess their risk for acquiring HCV infection during condomless anal and vaginal sex.

HCV can be spread among men who have sex with men (MSM), particularly HIV-positive MSM, and we explore this
through the findings from several studies later in this report.

**Tattooing and body piercing**

Use of contaminated equipment for tattooing and body piercing can also lead to the spread of HCV.

For more information about HCV prevention (and treatment) visit CATIE’s [Hepatitis C section](https://www.catie.org/en/health/hcv/).

**The outbreak among MSM**

For at least the past decade, an outbreak of sexually transmitted HCV has been occurring among MSM. The vast majority of these cases have occurred in HIV-positive MSM. Researchers in four high-income countries—Sweden, Switzerland, the Netherlands and Australia—have been investigating this outbreak among both HIV-negative and HIV-positive MSM. Their findings suggest that in MSM who are HIV negative and who do not engage in high-risk sexual and/or drug-using behaviour, HCV infection is relatively rare.

**The Swedish study**

Doctors at Stockholm’s leading sexually transmitted infections (STI) clinic offered HCV testing to MSM who did not have HIV. This study took place between October 2012 and March 2013. Blood samples that tested positive for HCV antibodies were later analysed with other tests, including those that could detect HCV’s genetic material (RNA). The antibody test can reveal if someone was exposed to HCV in the past but it cannot distinguish between past and current infection. The RNA test can reveal if HCV is being produced by infected cells and can uncover active and therefore current infection.

A total of 1,008 out of 1,061 men (95%) agreed to participate in the study. Their ages ranged from 16 to 82 years.

**Results**

Six of the men tested positive for HCV antibodies and further testing revealed the following:

- two of the six men had active HCV infection (HCV RNA was present)
- in the remaining men, three were previously exposed to HCV but had overcome this infection
- in the case of the sixth man, his immune system appeared to have inadvertently made antibodies that were similar to anti-HCV antibodies detected by the first round of screening for this study; doctors concluded that he had not been exposed to this virus
- none of the six men were co-infected with HIV

**Focus on the three men with past exposure to HCV**

There were several possible causes of exposure to HCV in these men, which the doctors identified as follows:

- one man had been in a medical facility in South America
- another man had a former partner with whom he injected street drugs and their sexual activity included fisting

Doctors did not have information about the third man’s risk factors.

**Focus on the two men with active HCV infection**

One of these men had a history of genital herpes and syphilis but no other STIs at present. This is an important point because these and other STIs can cause inflammation, sores or lesions (sometimes painless) that can act as an entry point for other germs, like HCV. He also disclosed that he did not engage in rough anal sex or sharing of sex toys.

The other man with HCV infection had a rectal Chlamydia infection and disclosed that he had engaged in fisting since 2012.

Overall, the Swedish team found that less than 1% (0.2%) of MSM in their study had ongoing HCV infection. This rate of HCV infection in HIV-negative MSM is similar to what is observed among the average HIV-negative Swedish population who do not use street drugs.
The Swiss study

Researchers at a sexual health clinic in Zurich recruited MSM for their study between January 2009 and July 2010. All blood samples were tested for HCV antibodies and HCV-related proteins. Samples that tested positive for either of these were further analysed for HCV’s genetic material. In total, the researchers analysed data from 840 MSM, whose ages ranged between 17 and 79 years. Researchers relied upon participants’ self-reports about their HIV status.

Results

As with the previously mentioned Swedish study, a large proportion of men (95%) who were offered HCV testing consented.

HIV status

- 19 men (2.3%) disclosed a previous HIV-positive test result
- 579 men (71%) stated that they had tested negative for HIV
- 188 men (23%) did not know their HIV status
- 54 men (7%) refused to disclose their HIV status

HCV results

Overall, seven men tested positive for HCV antibodies. None of the seven disclosed a previous diagnosis of HCV. Furthermore, HCV RNA was detected in only two participants, indicating active infection. Both of these men had immigrated to Switzerland from other countries. In one of those countries HCV infection is relatively common.

Overall, less than 1% of MSM in this study had HCV infection, broadly similar to what is seen among the average HIV-negative Swiss person who does not use street drugs. Among MSM who stated that they did not have HIV infection, researchers found a marginal statistical link between having tattoos and HCV. Bear in mind that the design of the Swiss study was cross-sectional. Such study designs are unable to make definitive links between cause and effect. That is, in the case of the Swiss study, researchers cannot be certain that unsafe tattooing was the source of HCV infection in some men.

An Australian study

We reported on the Swedish and Swiss studies because they were published in 2014. However, it may also be useful to review an Australian study with MSM published in 2010. In that study, researchers assessed HCV infection in 1,427 HIV-negative men recruited between 2001 and 2004. HCV antibodies were relatively uncommon, found in about 1% of men. This is broadly similar to the proportion of HCV in the average HIV-negative person in Australia. There was no trend of an increase over time in MSM in this study. The most significant risk factor for HCV was injecting street drugs. Two men with HCV antibodies who did not report injecting street drugs had other possible risk factors—body piercing and tattooing.

In the same study, between 2001 and 2007, five men developed antibodies to HCV. Only one of these five disclosed that he injected street drugs. Four of the men had sexual contact with HIV-positive men (in this study HCV is almost 10-fold more common among HIV-positive men). Three of the men disclosed the use of sex toys with their partners (sharing sex toys without first disinfecting them can inadvertently transmit germs), one reported fisting and one reported condomless sex.

In the same Australian study, 245 HIV-positive men were offered testing for HCV during 2005 and 2007, with 23 testing positive for HCV antibodies. According to the researchers, 18 of these 23 men responded to the question about whether they had ever injected street drugs, with 16 of these 18 (89%) disclosing that they had done so.

In their concluding remarks, the Australian researchers stated: “As [injecting street drugs] is probably more highly stigmatized than sexual-risk behaviour in this population, it is possible that [injecting street drugs] was under reported” in their study.
A study from the Netherlands

Researchers in Amsterdam have been keeping track of HCV (and HIV) in their city for several decades. To do this they regularly seek blood from participants and also ask them detailed questions about sexual and substance-using behaviour. Among a total of 777 HIV-positive men, HCV infections increased over time. In 1995, about 6% of HIV-positive MSM had HCV and by 2008 this figure had climbed to nearly 21%. After this time, the rate of new HCV infections in this population seems to have stabilized.

Among these 777 men, only 11% disclosed that they had ever injected street drugs. The usual high-risk sexual and substance-using risk factors were linked to HCV infection among HIV-positive men. However, the researchers found that fisting and use of recreational drugs became less linked to HCV infection over time. One possible explanation for this change, the Dutch scientists suggested, was that some MSM were becoming educated about behaviours that led to HCV infection and had reduced their risks. This possible explanation requires confirmation in a study designed to specifically assess HCV education and risk behaviours.

The researchers also analysed data gathered from 1,513 HIV-negative MSM from 2007 to 2010 to assess HCV infection. They found that rates of HCV infection in this population were low—less than 1% (0.6%). There was no significant change in HCV infection rates over this time. Furthermore, the proportion of HCV infections among HIV-negative MSM was similar to that of the average HIV-negative citizen of Amsterdam who did not engage in high-risk behaviour.

Why the increased risk for HIV-positive men?

Researchers in Australia who are experienced in studying the outbreak of HCV among HIV-positive men have reviewed data from many research projects in an attempt to put together explanations for the increase in HCV. According to their review and experience, there are several explanations, related to an interaction between behaviour, biology, germs and possibly some drugs. Here are some key factors followed by brief explanations:

**Behavioural factors**

Serosorting—researchers have found that some men choose to have condomless sex with partners of the same perceived HIV status, a behaviour called serosorting. Among some MSM, this has led to increased high-risk behaviour “such as reduced condom use and increased traumatic sex leading to higher levels of STIs,” stated the Australian researchers. Researchers in Berlin have also confirmed that serosorting leads to an increase in STIs. This can occur as people involved in serosorting generally think that the main germ of interest is HIV so they may not be as concerned about other STIs, including syphilis, gonorrhea, herpes, LGV (*lymphogranuloma venereum*) and human papilloma virus (HPV).

**Trauma to the mucosal surfaces**

The wet lining of the anus, penis and rectum is delicate and relatively rich in mucous. The tissue lining these and other wet areas of the body are called mucosa. At least three published studies with MSM have found a link between damage to mucosa during sex and transmission of HCV, as follows:

A study done in the UK (comparing 60 cases of HCV infection to 130 people who did not have this infection) found that HCV infection was most strongly associated with engagement in group sex. Men who engaged in group sex were more likely to have condomless sex (insertive or receptive) and to engage in fisting (receptive or insertive). Exposure to multiple partners means an increased risk of exposure to germs.

A German study (comparing 34 cases of HCV infection to 67 people without HCV) identified several risk factors such as rectal trauma with bleeding, being fisted without gloves, group sex and nasally administered recreational drugs. The German researchers made this statement:

“We suggest that blood rather than semen is the critical medium. An insertive partner’s fist (or penis), contaminated with blood, might serve as a vector for subsequent receptive partners in a group sex session, when condoms or gloves are either not applied or not changed for every new partner—particularly when using a collective supply of lubricant. Lesions in both the ano-rectal mucosa—from fisting, prolonged anal intercourse or rectal STIs—could serve both as a portal of entry and as a source of infection.”
A study in the U.S. (comparing 22 cases of HCV infection with 53 people who did not have HCV) generally found similar risks as the UK and German studies. However, in the U.S. study, two statistically significant risk factors were practising receptive anal intercourse without a condom when the insertive partner ejaculated and nasally administered recreational drugs.

Another U.S. study, done in the time before potent combination therapy for HIV (commonly called ART or HAART) was available, suggested that HCV could be transmitted sexually between MSM. Although sharing equipment for substance use was the strongest risk factor, having an enema/douching before receptive anal intercourse was also a risk factor for HCV infection.

**Drugs—Impact on the brain and mucosa**

One of the problems that bedevil researchers who study HCV transmission routes among MSM is the ability to be sure of the precise role that substance use plays. Studies of human behaviour tend to rely on self-reports by participants. As mentioned earlier, researchers suspect that some people do not disclose to researchers their behaviour about injecting street drugs. But even taking that into account, the intended effects of street drugs—getting high, inducing feelings of euphoria and relaxation—can cause people to temporarily lose their sense of judgement and control and to inadvertently engage in high-risk behaviour. However, as mentioned earlier, several studies have found a link between the use of nasally administered recreational drugs and an increased risk for becoming infected with HCV.

Regarding nasally administered drugs, in the previously mentioned German study, researchers made the following statement:

“A rolled banknote that is being circulated at a commercial sex party might be sufficient to expose consumers to HCV-contaminated blood.”

Some recreational drugs used by MSM, such as methamphetamine (crystal meth), can dry mucous membranes (the delicate tissues lining the openings of the body, such as in the anus, nose and penis), increasing the risk for bleeding. Other drugs that are being used include cocaine, ecstasy, mephedrone, gamma-hydroxybutyric acid (GHB) or its pre-cursor gamma-butyrolactone (GBL), and ketamine (special K).

**Other germs—HIV**

Some researchers think that HIV plays a role in the spread of HCV. It is possible that HIV, by weakening the immune system, may make some people more susceptible to HCV infection. It is also possible that HIV weakens the body’s ability to control HCV in co-infected people, which might increase the amount of HCV in their blood. Certainly, one U.S. study has found that this is the case.

A study from France compared fluid samples from 120 HCV-infected men, 82 of whom were co-infected with HIV. Researchers confirmed the U.S. finding that HCV levels in the blood of co-infected men were greater than in men with HCV infection alone. Also, from time to time, they were more likely to detect HCV in the semen of some co-infected men compared to men who were infected with HCV alone.

**Other germs—STIs**

Germs such as herpes, syphilis and LGV can cause sores, ulcers or lesions in delicate tissue inside the penis and anus (in addition to other parts of the body). These sores, ulcers or lesions could act as entry points for other germs such as HCV (and HIV). HCV experts have observed that the initial reports of HCV infection among some HIV-positive men noted that these men also had a history of LGV and syphilis. Other studies in France, Switzerland and Taiwan have all suggested that past or recent infection with syphilis can be linked to a future risk for acquiring HCV in MSM.

**In other high-income countries**

Reports from London, UK, as well as Tokyo, Japan, suggest that there may be an intersection of high-risk behaviours—involving sex and substance use—among some populations, including MSM. This may lead to the spread of both HIV and HCV.
HCV infection is not inevitable

As past experience with the nearly simultaneous outbreaks of LGV in Western Europe and North America has shown, outbreaks of sexually transmitted infections are not limited to one city or region but can and do spread to different continents. It is therefore possible that the outbreaks and behaviours being reported in London and Tokyo may be harbingers of what may be happening in other high-income countries.

All MSM can reduce their risk for acquiring HCV and other germs and can lead healthier lives by doing the following:

- practising safer sex, including changing condoms or gloves for every new partner
- having regular medical checkups
- getting frequent screening for STIs and treatment where necessary
- getting vaccinations for STIs (such as hepatitis A and B, and human papillomavirus)
- not sharing equipment for substance use
- consulting with a doctor for advice and support about overcoming addiction

For people who suspect that they may have HCV infection, speaking to their doctor about testing is a good first step. Should this screening confirm HCV infection, asking a doctor about treatment options begins the process of managing this disease. Highly effective HCV treatments are being approved for use in Canada and other high-income countries.

Resources

CATIE’s hepatitis C information

Canadian Guidelines on Sexually Transmitted Infections

INESSS – Guides sur le traitement pharmacologique des ITSS

References


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