



HIV Transmission via Blood to Blood Contact

By Eleanor Turnbull

The Human Immunodeficiency Virus (HIV) is a virus that is found in blood and other body fluids such as semen and vaginal fluids. The virus infects CD4 cells, found in our blood, which are part of our immune system. CD4 cells are weakened and destroyed by the presence of the HIV, preventing the immune system from working properly and culminating in people who live with HIV catching diseases and infections faster and with more severity; progressing onto the person developing Acquired Immunodeficiency Syndrome (AIDS). The virus cannot survive for long outside of a host, such as the body, so to be infected with HIV blood or bodily fluid, from an infected person, needs to enter directly into your body. The primary transmission route, via bodily fluids during unprotected sex, is mentioned frequently; this article will digress and explore HIV transmission via blood to blood contact which accounts for between 5-10% of all transmissions.

HIV-Transmission Routes with High Risk

The people at highest risk of HIV transmission by blood to blood contact are injecting drug users (IDUs), haemophiliacs and recipients of blood transfusions. Unsafe injections, thought to contribute to about 5% of all transmissions¹, are caused by sharing the same needle or syringe with someone who has the virus, either when injecting illegal drugs or receiving injections in a health centre. Global guidelines state that when sharing needles, or other instruments that cut or pierce the skin, it is vital the needles and syringes must be sterilised with bleach or boiled for twenty minutes². This includes instruments used for circumcision, tattoos, ear-piercing or acupuncture. As preventative HIV measures WHO advocate treating IDUs and setting up needle and syringe exchange programmes so as to provide IDUs with easy and free access to sterile equipment such as non-reusable syringes, encouraging IDUs to change, and not share syringes.

Transfusions or treatments with infected blood or blood products can lead to HIV transmission. Many parts of the world now routinely test donated blood for HIV before approving its use, but many countries lack the resources to do so. In addition people who have engaged in behaviours that put them at high-risk of HIV infection should not donate plasma, blood, organs, tissues or semen, as these can transmit the virus to the people receiving them. This strict blood screening means that in the majority of countries blood transfusions are nowadays relatively

¹ Control of Communicable Diseases Manual, 18th Edition.

² Where There is No Doctor, a Village Health Care Handbook for Africa, Ed. Werner, D., Thuman, C., Maxwell, J. & Pearson, A. pp. 75

safe. However many people already infected with HIV were not protected by these new laws and guidelines; the extent of people infected via this blood-blood transmission route has been recently highlighted in China. Journalists writing for *The Economist*³ report that in the early 1990's local officials encouraged poor people to supplement their meagre income by selling their blood. Traditionally Chinese people feel that they are weakened if they give blood; to combat this officials removed the sought after plasma from the blood and re-infused the blood back into the donors. Disastrously all the blood was pooled together, which meant that a donor was later re-infused with blood from many different people; with no screening or HIV tests this plasma business has been responsible for an estimated 55,000 people becoming infected with HIV, with a further 130,000 people in one province infected later by hospital blood transfusions from the same blood⁴. In response to this public-health disaster the central government tightened controls on the business and is providing free anti retroviral drugs to those affected.

HIV-Transmission Routes with Lower Risk

Health care workers, who can be directly exposed to the HIV-infected blood through injury with a needle or sharp object, have been shown to have a sero-conversion rate of under 0.5%⁵. Although this indicates that minimal chance of becoming infected with HIV there are also a multitude of preventative measure to protect these workers, such as provision of anti-AIDS medications to take after an accident.

When living with people known to have HIV the Centre for Disease Control and Prevention recommend that although the risk of household transmission is low it is important to take a few easy precautions so as to prevent transmission. Contact with blood, open sores, bloody diarrhoea or bloody vomit can spread the virus; preventative measures include covering the sores with a clean cloth or bandage, and wearing rubber or latex gloves, or plastic bags on your hands. In addition hands should be washed often and practices that increase the likelihood of blood contact, such as sharing of razors and toothbrushes, should be avoided.

Casual contact through closed-mouth or "social" kissing is not a risk for transmission of HIV. The risk of acquiring HIV during open-mouth kissing is believed to be very low, primarily as there is normally no blood-blood contact. Unfortunately in the later stages of symptomatic AIDS mouth ulceration and bleeding gums, associated with severe gingivitis, can commonly occur; at this time there is increased risk of blood-blood contact occurring in the mouth which can increase HIV transmission. On a similar note the Centre for Disease Control published findings in 1997 of a few incidents where blood-to-blood transmission of HIV had occurred via a human bite. Severe trauma with extensive tissue damage and the presence of blood were reported in each of these instances⁶. There are however numerous reports of bites that did *not* result in

³ Blood Debts" in *The Economist*, January 20th-26th 2007.

⁴ United Nations

⁵ *Control of Communicable Diseases Manual*, 18th Edition. Heymann, D.L (2004).

⁶ Blood-to-blood transmission of HIV via bite. *Int Conf AIDS 1996 Jul 7-12; 11:179 (abstract no. Mo.D.1728)*

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HIV infection so it should be noted that biting is not a common way of transmitting HIV; each severe case should be treated under the assumption of HIV transmission, and medical attention and testing should be sought.

Mythical HIV-Transmission Routes

HIV transmission via biting or blood sucking insects like mosquitoes, has been thoroughly researched; even in areas with high HIV prevalence and large numbers of insects no outbreaks have been recorded, hence it has been concluded by experts that HIV is not transmitted by insects⁷. This is primarily because biting insects only inject saliva, which acts as a lubricant or anticoagulant so the insect can feed efficiently, and blood is not transferred. Saliva can transmit diseases such as malaria and yellow fever, but because there is no blood to blood contact, when insects bite, HIV transmission cannot occur. Additionally although the HIV virus has been found in tears, sweat, urine and bronchial secretions virus transmission has never been recorded after contact with them⁸.

Methods of Prevention

This article has covered the principal ways that a healthy person can be infected with HIV via blood to blood contact, and the chief methods of HIV prevention and protection to infection. To reiterate all donated blood must be screened for HIV antibodies before it is used for transfusions, sterile needles and other sharp instruments should be used only when medically necessary and handled according to recommendations for health-care settings. Most importantly all instruments that will cut, puncture or pierce the skin must be thoroughly sterilised before each use and disposed of safely in puncture-proof containers, out of the reach of children. The WHO and other global organisations are preventing vast numbers of new HIV infections by treating injecting drug users (IDUs), initiating highly successful needle exchange programmes and supplying non-reusable needles, so that instruments cannot be shared. These initiatives are attempting to break a known vicious cycle between HIV, illegal drugs and unsafe sex, in particular with prostitution. HIV-infected IDUs have a good likelihood of turning to prostitution to earn money, whilst prostitutes may take drugs to help them cope. This cycle connects the different groups of high-risk populations, widening the number of people at risk of HIV infection and hence increasing HIV incidence of countries. I conclude this article in stating that although HIV transmission via blood-blood contact only directly contributes to 5-10% of infections it should not be ignored or forgotten. In the complex web of HIV transmission every mode of transmission must be tackled in order to have a substantial impact on mitigating the global spread of the disease; the social situation, behaviour and policies which facilitate HIV transmission via blood-blood contact need to be understood and drastically changed.

⁷ Misperceptions about HIV and Its Transmission. In: The Body- The complete HIV/AIDS resource. Centre for Disease Control and Prevention.

⁸ Control of Communicable Diseases Manual, 18th Edition. Heymann, D.L (2004).