

Sexual Transmission of AIDS

Of the various ways in which HIV can be transmitted, sexual contact is responsible for the greatest proportion of infections. It was initially believed that homosexual males were the only group at risk, but cases of AIDS were soon described in men and women who had become infected via heterosexual contact.

Sexual transmission of HIV is associated with transfer of bodily products; according to the type of sexual contact, vaginal secretions, saliva, urine, semen, rectal mucus, feces, and blood may be transferred. Although HIV has been isolated from all these substances, the mere presence of the virus—for example, in saliva—does not necessarily imply that a substance is an important vehicle for transmission; up to now only blood and semen are known for certain to play that role. Vaginal secretions have been implicated in sexual transmission of HIV, but confirmation is still lacking (1).

PORTALS OF ENTRY

Several studies have sought to determine the differences in transmission efficiency of different sexual practices and the portals of entry of the virus. Transmission has been found to occur from male to male, male to female, and female to male, with the frequency of transmission varying for each combination.

Anal intercourse. Sexual contact involving penetration of the penis into the rectum carries the greatest risk of transmission of HIV (2). This fact is explained primarily by the nature of the rectal epithelium, which is a layer of simple co-

lumbar cells, is richly vascularized, and contains abundant unencapsulated lymphoid tissue. The epithelium is often damaged during rectal penetration, permitting contact between HIV and the cells that have specific receptors on their membranes (CD4 surface marker).

Vaginal intercourse. HIV transmission appears to be less efficient via vaginal coitus owing to the anatomic and physiologic characteristics of the vaginal mucosa, which consists of a flat, stratified, unkeratinized epithelium that provides more resistance to solutions in contact with it.

Although HIV may be present in the female genital tract throughout the entire menstrual cycle, the risk of infection for both the woman and her male partner probably increases during the menstrual period. Hormonal changes that affect the vaginal mucosa permit easier access of the virus to the bloodstream, increasing the possibility of infection for the woman, and contact with blood would pose a potential threat to the male (3).

Some studies indicate a higher risk of transmission from an infected male to a female rather than the reverse (1), which could be due to the higher concentration of virus in semen as opposed to vaginal secretions. Also, it is likely that sexual relations in which there is contact with the oral mucosa (oral-penile, oral-vaginal, and oral-anal) favor transmission of HIV, although the importance of this route has not been confirmed.

CONTRIBUTING FACTORS

An association has been observed between transmission of HIV and some other microorganisms, among which are cytomegalovirus, herpesvirus, Epstein-

Source: Dirección General de Epidemiología, Secretaría de Salud, Mexico. Transmisión sexual. *Bol Mens SIDA* 2(1-2):231-241, 1988.

Barr virus, hepatitis B virus, and the bacterial agents of other sexually transmitted diseases (STDs) such as gonorrhea, syphilis, and venereal lymphogranuloma. The interaction of these cofactors may be due to the fact that the virus multiplies more actively when the immune system is stimulated, as occurs when there are multiple infections, or to the genital lesions produced by these infections, which facilitate entry of HIV.

In addition, a history of infection with microorganisms that cause other sexually transmitted infections may be a sign of risk-generating behaviors, since it indicates greater exposure to such agents, including HIV. In a study by Handsfield et al. (4), there was a relationship between the presence of anti-HIV antibodies and genital ulcers even after adjustment for the number of sexual partners, which suggests that some STDs are in themselves risk factors for infection with HIV.

EXPOSURE TO HIV

The number of exposures necessary for sexual transmission of HIV to occur is still unknown. Cases attributable to just one exposure have been recorded, and it is known that the risk increases in direct proportion to the number of sexual contacts with one or more infected persons (2). The problems that arise in trying to determine precisely the relationship that exists between exposures and risk of infection are due to the multiple variables that must be taken into account, such as type of sexual practice, number of exposures, number of sexual partners, phase of the infection, and other risk factors.

In one study of male-to-female heterosexual transmission, based on the duration and frequency of sexual relations, the risk of acquiring the virus was estimated to be one in 1,000 (5). It has been more difficult to determine the risk of transmission of HIV from female to male,

but one prospective study of spouses of AIDS victims found seroconversion in 42% of the men and 38% of the women within one to three years, which may indicate that the efficiency of transmission is similar in either direction (6).

PREVENTIVE MEASURES

Prevention of the sexual transmission of AIDS presents more problems than prevention of any other type of transmission, since it involves one of the most intimate and sensitive aspects of human behavior. As the means of transmission that is associated with the greatest number of cases, it is the one which must receive the most attention. Since there is not yet any effective vaccine or treatment available for AIDS, education and the modification of certain risky sexual behaviors constitute the only methods for preventing and controlling the disease.

Information and education campaigns and prevention programs must promote safer sexual practices, particularly among those persons who engage in high-risk or potentially risky behaviors. In this regard, it has been demonstrated that the risk of transmitting or acquiring HIV infection is substantially reduced by observation of the following general recommendations: a) limit sexual relations to only one partner or reduce the number of partners; b) avoid casual sexual relations; c) use a condom. The last of these recommendations has been widely publicized in educational campaigns the world over as an effective way to reduce the risk of the sexual transmission of AIDS. In addition, the use of certain spermicides, such as nonoxynol-9, has been suggested, since laboratory studies have shown that these substances inactivate not only HIV but also lymphocytes that contain it.

Finally, because evidence suggests that STDs facilitate transmission of HIV, it may be highly useful to incorporate pro-

grams of diagnosis and treatment of these infections into AIDS prevention programs.

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Criteria for HIV Screening Programs

Screening¹ for infection or disease indicators has undoubtedly benefited many public health programs, screened individuals, and the community at large—

Source: World Health Organization. Report of the WHO Meeting on Criteria for HIV-Screening Programs, Geneva, 20-21 May 1987. Document WHO/SPA/GLO/87.2. Geneva, 1987.

¹For the purpose of this report, HIV testing and screening are defined as follows: Testing is a serologic procedure for identifying HIV antibodies or antigens in an individual, whether recommended by a health care provider or requested by the individual. Screening is the systematic application of HIV testing, whether voluntary or mandatory, to any or all of the following: entire population; selected target populations; donors of blood or blood products and cells, tissues, and organs.

both when it has been used to detect treatable diseases which are otherwise difficult to recognize and also when it has been used to detect conditions for which there is no therapy. It is not surprising, then, that proposals for screening often arise in the context of the AIDS epidemic and of public health efforts to control its causative agents, human immunodeficiency virus (HIV) and related retroviruses.

Without question, the pandemic spread of HIV infection warrants close monitoring and public health planning. However, any HIV screening program raises delicate and difficult logistical, le-