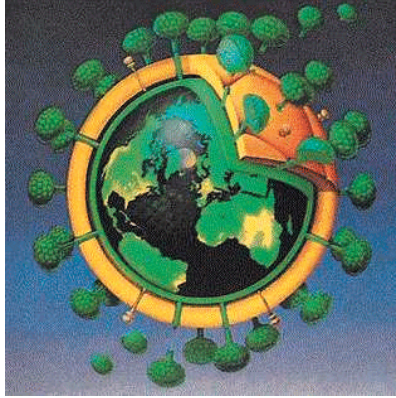


AIDS



What everyone should know about AIDS

General

AIDS (Acquired Immunodeficiency Syndrome) is the final stage of an infectious illness caused by the HIV (the human immunodeficiency virus). One of the peculiarities of HIV infection is the fact that the period between infection and the final AIDS stage (the latency period) lasts on average 12 years. The cases of AIDS we know about today are only a fraction of the total number of people infected. They show us a picture of the spread of the infection about ten years ago. Most of those infected with HIV will contract AIDS sooner or later unless the onset of the illness can be delayed, if not prevented, with the aid of drugs.

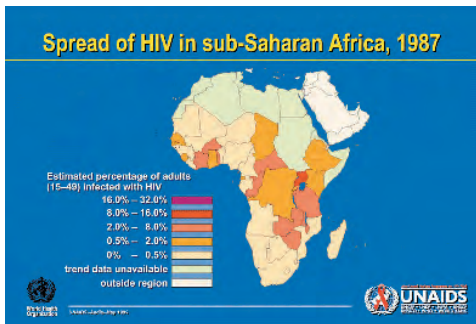
The origin and spread of the epidemic

AIDS is a relatively new illness. It is thought that HIV passed from monkeys to man a few decades ago. During the 60s and 70s, the infection spread incognito via sexual contact, first of all in Africa, then on the American continent and Europe, and finally in Asia. It was not until 1981 that AIDS was detected as an illness in the United States, first in homosexuals. In the West it was first thought that only homosexuals were affected by this sexually transmitted disease, since the first victims were homosexuals and injecting drug addicts.

In reality, it was already very widespread in the African population. In addition, it was also spreading in its latent form in the heterosexual population of the industrialised countries of the West and Asia.

It is estimated by the World Health Organisation (WHO) that 30.6–36.1 million infected people were still alive at the end of 2007. In the whole world, in 2007 alone, 1.8–4.1 million people contracted the virus, 4932–11'233 infections per day. Since the beginning of the epidemic, about 85.5 million people have caught HIV. More than 25 million have already died, 1.8–2.3 million of them in 2007. Worldwide the epidemic continues to advance. More than 75% of infections take place through sexual contact. These estimates are debated: other epidemiological organisations report even higher figures. In addition, in many countries the number of cases is unknown because of their inadequate health systems.

Sub-Saharan Africa is still the area most affected by AIDS. At the end of 2007, according to WHO, about 20.5–23.6 million infected people were to be found there, 1.6–2.1 million of whom had become infected during the previous year. More than half of these people were women of childbearing age. It is worth noting that about 90% of these people do not know they are infected. AIDS



has become Sub-Saharan Africa's most serious health problem and has already brought about a significant shortening of average life expectancy.

In the industrialised countries, the number of new infections is estimated at 80,000 per year. In Switzerland, up to the end of March 2009, 8845 cases of AIDS and 31,068 cases of HIV infection have been reported. But it is believed that the real figures are distinctly higher than this. Already more than half of the infections take place via heterosexual contact. The rate of infection (percentage of infections within a risk group) is still 30 to 40 times higher among homosexuals and injecting drug addicts than among heterosexuals.

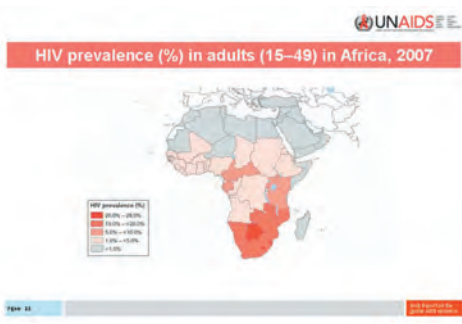
From infection to illness

The pathogens

At present, 2 types of HIV are known: HIV-1, which has 10 sub-types (A to J) and HIV-2, which has 5 sub-types. In addition, there is a whole range of unclassifiable strains, for example group O of HIV-1. And within each sub-type and strain innumerable variants can be observed.

Viruses like HIV are not independent organisms. In order to survive and reproduce, HIV relies on certain cells in the human organism. These cells, which give them lodgings, so to speak, are called host cells.

On infection, viruses enter the host cells, bringing with them «inverse transcriptase», an enzyme which transcribes RNA, the genome of the virus, into DNA, the human genome. In this way the genetic inheritance of the virus moves into that of the host cell and can lurk

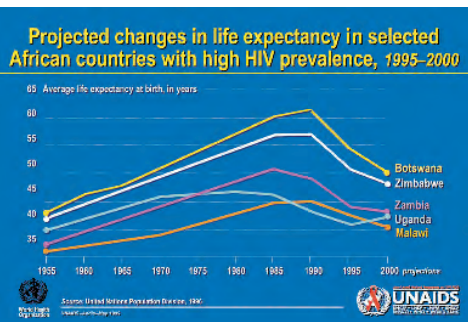


there for years. To multiply, the virus makes use of the host cell. Another enzyme, «protease», uses pieces of virus to manufacture new viruses, which leave the host cell and attack other cells. In the course of transcription of the genome and the copying of DNA to reproduce the virus, «translation errors» are made which give rise to new variants of HIV: these can differ in virulence and bring about death either more or less rapidly. Several million variants have been observed within a single individual.

This variability of HIV enables it to adapt to its environment, and consequently to develop rapid resistance to medication. This is one of the reasons why no one has yet managed to develop a vaccine or curative drugs.

Weakening and destruction of the immune system

The immune system has two main functions. It combats intruders in the form of bacteria, viruses, fungi, etc. which cause infectious diseases. At the same time, it prevents the survival of cancers by detecting and destroying those cells of the organism that are damaged or have degenerated.



It takes several years for the immune system to be defeated by these viruses. It is a real battle between two adversaries. We now know that within a few days of infection, billions(!) of new viruses are born. Thus, the viruses reproduce massively even during the latency period, when there are no symptoms. But the immune system destroys them gradually, so that for years a balance is maintained. But in the AIDS phase (stage C), the immune system becomes exhausted and the quantity of virus continues to grow. The result is increased vulnerability, especially with regard to infectious diseases and cancers.

Macrophages, the Trojan Horse of the organism

When the virus penetrates the mucous membranes, for example during sex, they are first captured by macrophage cells. These have the role of destroying pathogens (viruses, bacteria, fungi, or parasites) on their first contact with the organism. Sometimes these macrophages prevent infection. They also provide the immune system with an early warning that pathogens have breached this first «line of defence». But this alarm system, which generally works very well, breaks down in the case of HIV. In fact, HIV has the ability to hide inside the macrophages, reproduce there, and frustrate their action. In this way, HIV uses the macrophages as Trojan Horses, to invade the organism and reproduce inside it.

The lymphocytes are knocked out

Once the virus has entered the lymph nodes and the blood, it puts another unit of the immune system out of action: the CD4 lymphocytes. Like the macrophages, these have the job of combating pathogens. But HIV manages to «fool» them, using them as host cells in which it reproduces itself, and progressively preventing them from doing their job.

The antibodies

As with all infectious diseases, the immune system develops antibodies aimed at HIV to detect the pathogens and help to destroy them. However, since some of the HIV viruses hide in the cells of the organism, the antibodies,

which circulate in the blood, are unable to detect them and wipe them out.

Antibodies against HIV can be detected by tests which establish that infection has taken place.

Progress of the disease

Since 1993, three stages or categories have been generally recognized.

Stage A includes both the acute stage of viral invasion and the asymptomatic phase (no symptoms) which follows. After infection, most subjects present a clinical picture at the end of 2 to 6 weeks similar to flu, as with glandular fever: headache, fever, muscular pains, etc. This is followed by the asymptomatic phase, which can last for many years, during which the patient is not aware of any signs of illness. However, the virus is multiplying in his body and the patient can infect other people. Sometimes there is a painless enlargement of the lymph nodes in the groin, armpits, neck etc.; this can last for several months.

Diagnosing infection: the HIV test

The method of screening most commonly used is the Elisa test, which detects antibodies to HIV. The Western Blot is a specific test to confirm a positive Elisa test result. Various other antibody tests are available today, which are quick, cheap and easy to use and as reliable as the Elisa and Western Blot tests. Antibodies are now thought to be detectable two weeks after infection at the earliest but in most cases appear within three months of infection. Thus persons suspecting that they have become infected should wait three weeks before getting tested and, if the result is negative, must repeat the test 3 months later.

There are two tests that directly confirm that the virus is present: p24 antigenemia, which detects p24 antigen, a constituent of the virus, and polymerase chain reaction (PCR), which detects the virus's DNA. These are not used for routine screening.

Stage B comprises those symptoms which are characteristic of advanced damage to the immune system, but which do not come within the group of illnesses which define AIDS. Generally, the patient suffers from fever, night sweats, skin conditions producing itching all over the body, loss of weight and diarrhoea, without being able to pinpoint any cause. In addition, all sorts of infectious illnesses can appear: candidiasis of the mouth and pharynx, pneumonia, tuberculosis, etc.

Stage C is the final phase of the infection, AIDS itself, which is due to the collapse of the immune system. The total clinical picture presented by AIDS cannot be confused with anything else, but each of the pathological manifestations of which it is made up can appear in other illnesses. A large number of infectious illnesses and forms of cancer can arise. The most frequent are: fungal infections (e.g. candidiasis of the oesophagus, cryptococcal meningitis), viral infections (e.g. shingles, viral retinitis), rare forms of cancerous tumour (e.g. Kaposi's sarcoma), brain diseases (dementia, paralysis) and severe weight loss («wasting syndrome»).

In addition, doctors can follow the development of immunodeficiency by means of blood tests (levels of CD4 lymphocytes and measurement of the viral load). The higher the viral load and the lower the amount of lymphocytes, the more the immune system has been damaged and the greater the risk of opportunistic infections: illnesses caused by a pathogen that is only dangerous in the case of immunodeficiency.

Therapy

Nowadays, antiviral medicines are available to combat HIV infection. We now hope, with early treatment: (1) to delay the development of the illness, (2) to prevent the appearance of resistant varieties, (3) to make the patient less likely to pass on the virus to others. Transmission from mother to baby can be considerably reduced by giving antiviral medication to seropositive women in pregnancy. In industrialised countries, medical workers who are exposed to a risk of HIV infection, for example after being accidentally

stuck with a syringe needle, are given one or more anti-HIV drugs over a period of 2 to 4 weeks. This can reduce the risk of infection by 80%. It is not yet known whether this treatment can also prevent infection through sexual contact.

Transmission of HIV

HIV can only be transmitted directly from an infected patient to other people, but not as easily as the flu virus or the tuberculosis bacillus, which can be transmitted through the air (for example, when the infected person coughs or sneezes). HIV is only transmitted when an infected body fluid comes into contact with mucous membranes or broken skin (wounds, lesions, eczema) or if it enters directly into the bloodstream (cf. Macrophages: the Trojan Horse of the organism). HIV cannot cross healthy skin, because it is protected by its outer layer, the stratum corneum.

The virus is present in various organic fluids. Blood, seminal fluid, and vaginal fluids all contain a large amount of the virus. It has also been found in saliva, breast milk, tears, and urine, but in smaller quantities. On the other hand, it has not been detected in sweat.

Modes of transmission

Sexual activity: HIV infection is first and foremost a sexually transmitted disease (STD). Infection takes place both through sperm and through vaginal fluids. A single sexual contact with someone who is seropositive can be enough to infect you. Oral-genital sex (fellatio, cunnilingus) and French kissing are also dangerous.

Mother to baby transmission: A seropositive mother can pass HIV on to her baby during pregnancy, while giving birth, and when breastfeeding. The infection rate is 25 to 35%. This risk can be reduced by means of AZT therapy.

Medical and surgical equipment: The use of non-sterile medical and surgical equipment (gloves, forceps, surgical knives, syringes and needles, speculums, etc.) is a potent means of HIV transmission.

Blood transfusions and organ transplants:

In all industrialised countries, blood and organ donors are tested (in Switzerland, since autumn 1985). The risk of failing to identify a seropositive donor is extremely low (in Switzerland, it is thought to be 1:500,000). In Third World countries, particularly in Africa and South America, blood supplies may not be free of the virus.

Health workers: If the rules of hygiene necessary in a hospital environment are adhered to, health workers are very unlikely to be infected. The most frequent case is that of injury from a needle contaminated with blood from a seropositive patient. This is estimated to carry an infection risk of 0.3%.

Rare modes of transmission: There are also some other modes of transmission which, though just as tragic as the above on an individual basis, have little significance from an epidemiological point of view: tattoos, bites, transmission of HIV by a surgeon to his patients, etc.

Protecting yourself against HIV infection

As no vaccine or curative drug will be developed in the near future, prevention remains vital: it is important to avoid all risk behaviour.

- **Faithfulness:** In a faithful loving relationship between two partners who are not infected, transmission is not possible.
- **Meticulous choice of partner:** Nowadays, any new sexual relationship carries a theoretical risk of HIV infection, and so it is essential to choose your partner very carefully. Infection can only be ruled out if your partner is not infected. The fewer different partners you have the lower your risk of infection.
- **HIV Test:** If there is any doubt as to whether a partner is seropositive, testing is imperative. It is the only way to confirm or quash the suspicion (cf. Diagnosing infection: the HIV test).
- **Condoms:** When a sexual partner is infected with HIV, using a condom reduces the risk of transmission, but does not remove it

completely. Even when using standardised condoms, a small percentage risk remains.

- **Avoiding all drugs:** Drugs and alcohol affect the sense of reality and responsibility, impair judgment and self-control, and encourage impulsive and unprotected sex. This makes avoidance of drugs and alcohol an important part of prevention.

Careful choice of partner, faithfulness, abstinence, the HIV test and the condom are all ways of preventing or reducing the risk of HIV infection. They are even more effective in combination. By choosing to use these methods and combining them, everyone is able to reduce the risk of infection.

No risk of infection

- In public places: workplace, school, public transport, toilets, swimming pools, etc.
- On skin contact, such as shaking hands, hugging, kissing on the cheek.
- Taking part in sports such as ball games.
- At table, in restaurants.
- From sex between partners who are faithful and seronegative (so long as neither of them is exposed to risks other than those connected with sex).

It is, of course, essential to observe the usual rules of hygiene and to avoid any contact with open wounds.

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Art Work: Graphico (Hamburg)

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