

Acute Infection

The first symptoms of HIV infection, sometimes called acute HIV infection or primary HIV infection, occur about 1 to 4 weeks after the virus was transmitted. Probably at least 50 percent and possibly 90 percent of all people with HIV infection have the symptoms of acute HIV infection.

After HIV is transmitted, it moves to the lymph nodes nearest the site of infection, where it then multiplies. Within days, it moves by the blood stream to other lymph nodes, where it multiplies massively, showering the blood with high concentrations of new viruses. The concentrations of HIV in the blood during this early stage of infection are often about 1,000,000 viruses per milliliter. These high concentrations are accompanied by the symptoms of acute infection. This is the time when people are most contagious.

Many of the symptoms of acute infection are nonspecific; that is, they are also symptoms of many common viral infections. Symptoms include fever, sweats, malaise, fatigue, achiness, joint pain, headaches, a sore throat, trouble swallowing, and enlarged lymph glands. Most people lose weight, often as much as 15 to 20 pounds. Some people have a rash consisting of red spots or splotches over the chest, back, and abdomen. Some have evidence of infection of the brain: severe headaches, mood changes, personality changes, irritability, and confusion. Occasionally, people lose the use of their arms or legs for a short time, then regain use again.

Because some of these symptoms resemble those of infectious mononucleosis, the acute infection stage is sometimes referred to as a mononucleosis-like syndrome. Mononucleosis, however, is caused by an entirely different virus, and with acute HIV infection the blood test for mononucleosis is negative.

Some people with HIV infection have no recollection of an acute infection stage; some mistake it for a common viral infection or flu, and some people feel sick enough to go to a physician. A physician may find a rash, enlarged lymph glands, an enlarged spleen, and an enlarged liver. A blood count will show fewer white blood cells than normal -- but then, a low white count accompanies most viral infections. The CD4 cell count also decreases, but does not usually decrease much below the lower limits of normal. Liver tests may show changes suggesting mild hepatitis, but many other conditions cause similar changes. A spinal tap to analyze cerebrospinal fluid (the fluid that bathes the brain and spinal cord) may show evidence of meningitis. The usual blood test for HIV, which detects antibodies to HIV, will be negative at this time but will usually become positive within three to ten weeks. Blood tests for HIV instead of the antibody to HIV will be positive. The usual test for HIV is the viral load test. The viral load test usually shows counts that are very high, often over 100,000 or 1 million.

Acute HIV infection can last from one to three weeks. People who have a fever that lasts for over two weeks are more likely to have HIV infection that progresses rapidly. Occasionally, people have excessive fatigue that may last weeks or months. All people recover from acute HIV infection, as a result of their immune responses. The recovery is accompanied by the disappearance of symptoms and a sharp decrease in the viral load.

Acute HIV infection is important to recognize, because many authorities think this is the best time to start treatments. The reasons for treatment during this stage are several: the symptoms may

disappear more rapidly; the virus has not yet mutated extensively and so has had little opportunity to become resistant to drugs; and most importantly, the immune system has little or no damage and so may most effectively be kept intact. An intact immune system can continue to react to HIV as it does to other viruses: HIV wouldn't be eliminated, but it might be kept in check.

Seroconversion

At the time of acute infection with HIV, the body has not yet made antibodies to HIV. Antibodies, proteins produced primarily by certain white blood cells called B lymphocytes, attack substances foreign to the body, including viruses. The fact that symptoms are present even though the blood test to detect antibodies to HIV is negative is not unusual. In most other infections, symptoms precede the body's production of antibodies, and the symptoms disappear once antibodies are produced.

The body usually takes several days or weeks to recognize a foreign substance like a virus, and then it produces antibodies to attack the substance. Six to twelve weeks after HIV has entered the body, antibodies to HIV appear in the blood in sufficient concentration to give a positive blood test. Physicians call this appearance of antibodies seroconversion. That is, the result of a test for antibodies in the blood serum converts from negative to positive. Over 95 percent of people have positive HIV tests by three months after transmission, and over 99 percent have positive tests by six months.

Antibodies against most viral infections, once they appear, eliminate the virus and then stay in the body to protect against future infections by the same virus. Virtually all people with HIV infection develop antibodies against HIV. These antibodies, along with other immune system mechanisms, reduce the concentration of HIV but do not eliminate HIV. Besides antibodies, the other immune defenses that seem important are the CD8 cells. CD8 cells are lymphocytes that include a subset called CD8-38 cells, which are programmed to attack HIV by hormones called cytokines produced by the CD4 cells. This means that a good immune response requires that CD4 cells recognize HIV and then produce cytokines to goose the CD8-38 cells, which then destroy HIV. A goal of early treatment is to preserve this function of the CD4 cells before HIV destroys it.

The problem with all this is that most people with acute HIV infection never see a doctor, and even if they do, the doctor does the diagnostic tests only 25 to 30 percent of the time.

Asymptomatic Period

For several years after seroconversion, people with HIV infection feel good. Because they have no symptoms of the infection, this period has been called the asymptomatic (meaning "no symptoms") period. During this period the person will be unaware of the HIV infection unless a blood test shows antibodies to HIV. About 70 to 80 percent of the people who presently have HIV infection are in this asymptomatic period.

For many years, we thought that during the asymptomatic period HIV was resting and not reproducing. We now know this is not the case. HIV is reproducing at an amazing rate, every day making an average of 10 billion new viruses, and every day destroying a comparable number of CD4 cells. And every day, the body produces enough new CD4 cells to nearly offset the loss. But the body, in the long run, can't quite keep up. The average net loss of CD4 cells is fifty per year, accounting for the gradual decline in CD4 cell counts over the years.

The actual rate of decline, however, is highly variable. About six months after the virus is transmitted, the amount of HIV in the blood reaches a "set point," a point at which, without treatment, it may stay for several years. If HIV's set point is high, the immune system is not controlling the virus well; the CD4 count falls quickly and the time before AIDS occurs is short. If the set point is low, the CD4 count falls slowly and the time to AIDS is long. This relation between the set point and the progress of the disease makes sense: the viral load is a direct reflection of how fast HIV is multiplying and how well the immune system is controlling it. More viruses mean more CD4 cells are infected and destroyed, so AIDS will be earlier and survival shorter. After years of research, we believe the most critical difference between people whose disease progresses quickly and those whose disease progresses slowly is a difference in their immune responses.

We also know that treatment makes a decisive difference in the rate of the infection's progression because treatment resets the set point. The drugs directed against HIV keep the virus from reproducing in the test tube; and the drugs, when given to people, measurably decrease the amount of virus in the blood and do so within hours. In most people who can take treatment successfully, 99 percent of the virus will be eliminated within four weeks; and within four to six months, most of these people will have "no detectable HIV."

All people with HIV infection should have regular medical care. Options for medical care will depend to some extent on the resources available (see chapter 8; options for financing this care are discussed in chapter 10). Regular medical care usually includes medical evaluations every three to four months. During the visits, your previous medical problems should be reviewed, and any symptoms or conditions that may or may not be related to HIV infection should be discussed. During the visits, you should also have a physical examination and any necessary laboratory tests. Your physician should then candidly discuss your health status with you and should recommend subsequent medical care.

The principal laboratory tests are the CD4 cell count and the HIV viral load test. These tests are usually given to all people with HIV infection every three to four months. The purpose of the CD4 count is to evaluate the state of the immune system. The purpose of the viral load test is to evaluate the prognosis based on the rate of viral reproduction. The two tests are complementary. A low CD4 count means vulnerability to complications regardless of the viral load. And the viral load gives the speed of progression regardless of the CD4 count. These tests are critical to making good decisions for treatment.

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