

Update On AIDS

Gary J. LaBianco, D.P.M.

AIDS and HIV-positive patients are a growing part of all types of health care practices. With the increase in technology and improved treatments, the life span of a healthy HIV patient at the time of diagnosis has increased past 10 years. AIDS as a disease is trending away from an acute illness with a short hospitalization followed by death. The disease has now taken on a chronic state for most patients. In the next decade, HIV may follow a similar chronic medical course as seen with insulin-dependent diabetes mellitus. Following the increasing number of HIV-positive patients will be an increase in the number of HIV-positive and AIDS patients seen by podiatric physicians. These patients, and their physicians, will be faced with complex social, emotional, and moral issues pertaining to their specialized medical problems and the appropriate treatments. Due to these complex issues, many of these patients will face the dilemma of revealing their HIV-positive status to practitioners during the history and physical. Many will exclude this vital information, leaving the health care provider open to uninformed exposure.

Fortunately, many patients are now able to overcome the social outcasting that has been set upon the disease and HIV-positive patients by society. These patients are well informed about their disease state and will be of great value to the health care provider in history and staging of their HIV status. These patients will know their T-cell counts, as well as trends in their blood chemistries and daily body temperatures. HIV is most certainly a disease which is controlled in part by patient education. Due to proper medical education, these patients know the signs and symptoms involved with infection and other HIV related problems. This enables them to seek medical attention quickly, possibly preventing sequela from escalating.

In treating these patients, a review of HIV, ARC and AIDS is appropriate including updated statistics, universal precautions, and surgical candidacy. As stated earlier, HIV is complex in emotional, social, moral and medical aspects. The podiatric surgeon/physician must play a role in the

initial diagnosis and follow-up care of these patients.

AIDS, A DISEASE IN REVIEW

History

Human Immunodeficiency Virus clinical characteristics were initially discovered in 1981 as part of an unusual group of medical problems, including *Pneumocystis carinii* pneumonia, Kaposi's sarcoma, and idiopathic immunodeficiency. At that time, it was noted only in homosexual males. By 1983, Montagnier et al. had discovered a retrovirus that was termed Lymphadenopathy Associated Virus (LAV). Shortly following this discovery, Gallo et al. confirmed the virus and termed it Human T-Cell Lymphotropic Virus (HTLV). With further research, the virus was renamed Human Immunodeficiency Virus I (HIV I). However, prior to 1981, and as early as the 1960s, idiopathic immunosuppressed patients with opportunistic infections had been documented. In the early 1980s, the AIDS syndrome of diseases was seen in homosexual males and intravenous drug abusers. This is the source of the stereotypical thinking surrounding today's AIDS patients. In 1985, a second form of the HIV virus was discovered, and termed HIV II. At this time, no further HIV type viruses exist.

Transmission

Transmission of the HIV virus is through contact with body fluids alone. The virus is transmitted from person to person through sexual intercourse in semen or vaginal secretions, from mother to fetus through the uterus, and through direct contact with blood passing through the skin or mucus membranes. HIV is found in highest concentration in blood, semen, and vaginal secretions. Viral concentration is sharply decreased in saliva and breast milk. Only one case of transmission through saliva exists, and none yet in the case of breast milk, but both are thought to be important vehicles of transmission. At this time, no evidence of transmission

has been documented through ingestion, inhalation, or insect bites.

Biology of HIV

The HIV virus is a retrovirus in the lentiviral or slow virus category. Human immunodeficiency virus is the first human lentivirus. Through three dimensional genetic mapping, not only can HIV I and II be recognized, but also the fact that HIV and all of the other lentiviruses did not come from a single central virus. Retroviruses have RNA genomes that are replicated with a DNA intermediate into the host cell. Guiding this process is RNA directed DNA polymerase, also known as reverse transcriptase.

Replication

Replication begins with viral attachment to the CD4+ surface antigen sites on the T-helper lymphocytes, and any other cell expressing the CD4+ surface antigen. Fusion of the virus occurs with the viral envelope to the CD4+ site. Once fusion has taken place, the virus is free to begin replication inside the host cell via reverse transcriptase. Double stranded DNA is formed in copying the RNA genome. An integration of the host cell chromosomal DNA is completed, stabilizing the DNA replication. Finally, the DNA is transcribed by RNA polymerase II, and the viral mRNA particles are translated into structural proteins. New virions are released extracellularly in pursuit of a new host cell with which to replicate. Replication of the virions can take place intracellularly in the vacuoles of lymphocytes and monocytes. The completely replicated HIV virus contains three structural genes: *env*, *gag*, *pol*; and six complementary genes: *tat*, *rev*, *vif*, *nef*, *vpr*, *vpu*. Serological response is mounted against *gag* and *env*.

Human Immune Response

Immediately following the initial HIV infection, each individual mounts both a cell mediated and humoral mediated response. IgM antibodies have been detected within five days of infection. In the majority of cases, the patient should seroconvert in approximately two to seven weeks, although periods up to a year have been noted. Despite the immune response, the HIV virus continues to thrive in all individuals. Most host cells hold the virus in an immuno-silent position so that viral

antigens cannot be recognized. With this silent position, the CD8 lymphocytes of the Class I virus specific cytotoxic lymphocytes are unable to destroy the invading virus. The initial humoral response is directed against the p24 viral antigen. At this time a laboratory test for these antibodies exists. At some point in time, the virus must become activated from a silent dormant state. It is not known what the activating factors are. Possibilities include environmental stimuli, Cytomegalovirus (CMV), Epstein-Barr Virus (EBV), Hepatitis B, and Herpes simplex.

With activation of the virus, the patient's initial CD4+ T-cell count should decrease, and then rise again, followed by many years of viral latency and a slow decline in T-cells, culminating with the death of the patient. With the initial presentation of HIV, many patients will express generalized malaise or influenza type symptoms. Unfortunately, these initial symptoms are generalized and some patients will have no prodromal symptoms. In general, the trends in the patients CD4+ / CD8 T-cell counts will reflect the patients clinical course. However, there are many documented cases in which a patient has continued to remain free of opportunistic infections for years, with T-cell counts under 50. Due to the decrease in T-cells, the HIV-positive patient succumbs to viral, fungal, mycobacterial, and protozoan infections, as T-cells are needed to immunologically respond to these infectious agents.

STATISTICS

AIDS has become the number one killer of all males age 25 to 44, black males age 25 to 44, and the number four killer of women in the same age bracket. There are no documented cases of patient survival at this time. Presently, there are approximately 334,344 patients in the United States with AIDS, and 201,775 people have already perished. Many sources state that over 1 million people are currently HIV positive. Due to the confidentiality of the HIV test, in which only positive results are recorded, an HIV-positive patient could be tested several times and be accounted for each time. This discrepancy has prompted the Center for Disease Control and Prevention to dismiss such statistics.

Women now account for 14% of all AIDS cases, up from 2% in past years. This is due to the leading cause of transmission, which is now

heterosexual sex with men having an IV drug abuse history, which accounts for 59% of transmissions. At this time, seventy five percent of women with AIDS are black or Hispanic. It is thought that 3/1000 students age 16-21 are HIV-positive. Homosexual and bisexual males continue to account for approximately 60% of the known HIV-positive cases on record.

Health Care and Transmission

Transmission of the HIV virus is an area of chief concern for all health care workers. Studies involving thousands of cases with HIV-positive surgeons and HIV-negative patients shows that the HIV virus has never been transmitted from a surgeon to a patient. This, however, does not include six cases in which a dentist transmitted HIV to six of his patients. There is a continuing debate over whether he infected the patients on purpose. Thirty-two cases have been recorded in which a health care worker has become infected by a patient, with no other possible route of transmission. Most of these involved massive exposures or open bore needle sticks. These statistics appear benign due to the low incidence of health care worker transmission. Every time a physician or health care worker attempts an invasive surgical procedure on an HIV-positive or AIDS patient, he or she is at some risk of transmission.

HIV-POSITIVE AND AIDS PATIENTS AS SURGICAL CANDIDATES

Without question, due to the nature of the disease, most AIDS patients will require some invasive surgical procedures to prolong their lives. All of these will be surgical procedures of necessity rather than elective procedures. Central vascular access, abdominal surgery and excision of tumors will rate high on the list. Therefore, the elective surgeon has a minor place in HIV surgery. With elective procedures, the surgeon must consider both the risk to himself and the potential complications to the patient. If a patient is no longer able to walk due to unremitant pain following all types of conservative care, surgical correction must be considered.

In the case of traumatic injuries, such as open fractures, lacerations, non-reducible dislocations, osteomyelitis, and infected ulcerations of the foot and ankle, the podiatric surgeon will be forced to

take action. As part of the preoperative evaluation, the surgeon must consult with the patient's HIV primary care physician. Many times this will be an infectious disease specialist or an internist. Certainly, a health care team-approach is mandatory in making the final surgical considerations.

When surgery is chosen as the final option, universal precautions / body substance isolation must be strictly adhered to. The Occupational Safety and Health Administration (OSHA) has established guidelines for dealing with body fluids, which have been in place since 1992, and have not been amended since that time. These same precautions must be used by all health-care workers in everyday practice, due to the uncertainty involving every patient's transmittable disease status.

THE PODIATRIC PHYSICIAN AND HIV

Each day, podiatric physicians and surgeons are seeing potential HIV-positive patients in their offices and clinics. Young patients with severely mycotic nails, Kaposi's sarcoma lesions, and a history suggesting HIV exposure must be examined for the possibility of being infected. HIV testing requires informed consent, and is the first place to begin. If the patient is HIV-positive, the next step is to check the patient's CD4+/CD8 T-cell levels to establish the stage of disease. With today's treatments for HIV, staging of the disease is of primary importance. Treatment can do little to prolong the functional life for a patient with a T-Cell below count 50.

This year, the CDC has added to its list of AIDS characteristics that a patient with 200 or less CD4+ cells is officially an AIDS patient and no longer only HIV-positive. Patients with T-cells of 200 or more may prove to be satisfactory surgical candidates, while patients with 50 or less T-cells will be poor candidates due to a high incidence of postoperative complications. Treatment will significantly prolong a patient's life with 500 CD4+ cells. Due to this factor, the referral of these patients to an HIV specialist for education about the disease and treatment is imperative.

CONCLUSION

There is a significant place in the diagnosis and treatment of HIV-positive patients for the podiatric physician and surgeon. Diagnosing new HIV-positive patients can only help prolong the lives of those patients, and help prevent possible exposures to other people. AIDS is an acute disease that with treatment can become chronic in nature. One method of decreasing the HIV-positive population is to identify those who are at risk, and educate them about transmission prevention. Unfortunately, with the new HIV-positive diagnosis comes the social prejudice that accompanies the disease.

Social, moral, emotional, and physical issues will need to be addressed by both the patient and physician. This is a multifaceted disease with many types of physicians working with the same goal in mind. That goal is to prolong the functional life of HIV-positive patients through education, prevention and early treatment. In this role, the podiatrist can fill a needed position as both a primary care physician and surgeon.

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