

AIDS in the tropics: How does it spread?

by Dr. Mark Whiteside

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... Increasingly in the state of Florida, in a sub-tropical area, we are seeing men and women, heterosexuals, who may not have the usual risk factors that we are inclined to think about in developed countries, including the United States and Europe.

We are very interested in environmental factors in relation to the disease in the tropics. This includes insect-transmitted diseases, which we will talk about; other blood mechanisms in the tropics, for example, sores rubbing against sores in crowded living conditions. AIDS is presumably caught by virus, or viruses that go into the blood stream. We think that some of these environmental factors are being unfortunately neglected today. We think it is critical to study them, for they have great significance for prevention and control of this disease.

AIDS is becoming a worldwide disease, with a rapid increase in Africa, the Caribbean, South America, as well as concentration in risk-groups in other areas, such as the United States and Europe. . . . Many areas show a relentless increase, and especially in south Florida, we think we are seeing a very different pattern of the disease, with more cases outside the established and so-called risk groups. . . .

The coming debate is over how much disease we will see transferred between men and women. Heterosexual transmission today has been very rare in the United States. It was at least rare in the case of male to female transmission. . . . We don't know if AIDS can be transmitted from woman to man, although that is the subject of intense investigation. We think it needs to be studied, but we don't think it explains the equal sex ratio in the tropics, for example in Central Africa. That's part of the reason we are interested in environmental factors.

In many parts of the world, AIDS is parallel to insect-

transmitted viruses, for example, Dengue. The AIDS belt seems to be also the insect belt in many areas of the world, such as the belt for Kaposi's sarcoma and Burkitt's lymphoma. The epicenter of the endemic Kaposi's sarcoma is the area between Zaire and Uganda, and of course modern day AIDS is increasing rapidly in men and women—almost equally in men and women in Central Africa—and spreading somewhat to East and West Africa. . . .

We think that AIDS has a broad base in the Caribbean, and is increasing in many of the major islands of the Caribbean, from Cuba on over to Puerto Rico. We have never thought it was limited to Haiti, but Haiti is the poorest country there. AIDS is spreading in Cuba, the Dominican Republic, Jamaica, Puerto Rico, etc., including heterosexual AIDS as well as high-risk AIDS (homosexual men, intravenous drug users, etc.). In the United States, about 17% of the AIDS patients are Hispanic individuals, which often means Caribbean. . . .

AIDS does not show only one abnormality in the lab, but many, like low white blood cell count, low lymphocyte count, depression in the ratio of helper lymphocytes to suppressor lymphocytes, sometimes anemia and low platelets, causing the production of antibodies to several different viruses, including the implicated cause of AIDS, HTLV-III/LAV virus. But we don't think that LAV is the only cause of AIDS. These people often have antibodies to several different virus agents. We noticed that symptoms of AIDS resembled the symptoms of many viruses, including insect- or mosquito-borne viruses, which we call arboviruses, and especially parallel were severe forms of arboviral disease, the prototype of modern Dengue hemorrhagic fever. . . .

Environmental factors: the case of Florida

Our clinic is in Miami, but we have worked in Belle Glade for several years, and I run the tropical disease clinic in Belle Glade, working with the county health department of Palm Beach County. We have had a screening program for AIDS among sexually active homosexual men in Key West for a number of years. Belle Glade has about 20,000 people, Key West about 25,000—small towns with a high prevalence and incidence of AIDS. There are over 1,200 AIDS patients in the state of Florida, with over 500 in Miami. There are neighborhoods in Little Haiti in Miami with multiple cases of AIDS among Haitians, and AIDS cases among other groups are beginning to show up. The Haitians are clustered within a certain section of Miami. We noticed that in the places where our Haitian patients lived, there were many public health problems. We had seen more disease in the environmentally poorest areas, which is what got us interested in looking into environmental factors, even before going up to Belle Glade.

We gathered mosquitoes from an abandoned swimming pool in Little Haiti, in an area of high incidence of AIDS. This old swimming pool was breeding not hundreds or thousands, but *millions* of the *Culex* mosquito, which is the South-

ern house mosquito and an efficient vector of encephalitis. The well in front of the house was breeding *Aedes aegypti*, which is the urban vector of Dengue and, in the past, of yellow fever. It took us almost two years to clean up this swimming pool. *Culex* likes dirty water, while *Aedes aegypti* breeds in clean water.

Little Haiti has also one of the highest populations of rats in the city. We still have blood saved from rats that we are looking at as a reservoir for some of these viral kinds of infection. Rats have played an important part in epidemics throughout history.

In Key West, there are 50 cases of AIDS, 50 cases of multiple sclerosis, which is a neurologic disease. The homosexual men for whom we had screening and an educational program came from the old part of Key West.

Belle Glade is isolated, rural, agricultural, with sugar cane and vegetables. It's about 75 miles northwest of Miami. It has the highest rate of AIDS in the United States, 2.5 per thousand, with a steady increase. It has been documented that in the poorer areas of Belle Glade, 10% of people are sero-positive, as to antibodies HTLV-III/LAV. Some 1 in 10 so far is infected in that neighborhood, and already 1 in 200 has AIDS.

Over half of our AIDS cases in Belle Glade are in men and women who do not fit into the usual risk groups. That includes 30% born in the Caribbean, and 20% born in the Southeast of the United States, men and women, heterosexual, and belonging to what we call non-identified risk (NIR) groups. The final striking thing, is that all our cases have long-term residence in one of two central depressed neighborhoods, the same neighborhoods which have been described as world-class slums for some time.

There are 50 confirmed cases of AIDS in Belle Glade, but we know that AIDS is under-reported by a factor of at least three to one, because of lack of diagnostic facilities, and there have been very few autopsies in the past. In this rural area, we know that there are, therefore, many more cases of AIDS than those which got reported—and this will be true for many other areas. But at least, in Belle Glade, we are keeping track: We have lists of our AIDS patients, our ARC [AIDS-related complex] high-risk patients, our HTLV-III/LAV sero-positive patients identified by the Institute of Tropical Medicine or by the Centers for Disease Control. We have 50 confirmed cases, 100 suspect cases—many of whom have died before diagnosis—200 ARC, and at least 500 HTLV-III-positive individuals, in this one small town. As of one year ago, all these patients had long-time residence in one of two small neighborhoods.

We are seeing an overlay with cases of tuberculosis, which are increasing in the same areas. Tuberculosis has long been recognized as an environmental disease, but I don't know anyone who considers it to be a sexually transmitted disease. Who knows, maybe it will be reclassified?

It is very difficult to convey the impression one gets when

walking through the slums of Belle Glade. Much of Belle Glade is a nice middle-class town, with no disease. The central depressed neighborhoods are mostly non-white, mostly native-born black Americans, but with a Caribbean influx of Haitians and other groups. Ten thousand Caribbean workers, Jamaican workers mainly in sugar cane, experience overcrowding and tremendous public health problems. When we do our environmental survey, we will go down the list, and often over 90% of the items on that list are going to be positive: active and potential insect-breeding, high rat populations, other animals, animal sewage, raw sewage, etc. . . .

What really causes AIDS?

With crowded living conditions, many blood-sucking insects, and high levels of viremia, one can get mechanical transmission of retroviruses. We think that includes HTLV-III/LAV, although that has not been proven in humans. It is known that animal retroviruses, however—like equine infections leucemia, bovine leucemia—can be transmitted mechanically by blood-sucking insects. In fact, that's one of the main ways they are transmitted, again in conditions of crowding where there are many, many insects.

I know this is very controversial, because most people consider the retrovirus HTLV-III/LAV to be the cause of AIDS. It should be pointed out that it has not been proven to be the cause of AIDS. . . . Even if one thought AIDS was caused by only one agent, we know that animal retroviruses are transmitted mechanically, so insect transmission should be studied anyway.

In south Florida, we have high levels of urban-breeding mosquitoes that like containers. We have not identified a mosquito vector or carrier yet, although this summer we are going to begin collecting mosquitoes, and look for retrovirus as well as arbovirus in our target areas, and this would include Belle Glade. . . .

Again, the coming debate is over how much heterosexual transmission there is of AIDS. In the United States, we would argue that it has been very limited. . . . There have been no female cases in the areas of high incidence, including Key West, and only one female heterosexual contact case in the entire city of San Francisco. Our main objection, is that we don't think there are good control studies of the data to date. Most of the studies, even the Centers for Disease Control study in Belle Glade, are very biased to look at sexually transmitted disease, to the virtual exclusion of environmental factors. . . .

In south Florida, we live in a swamp. We must not forget the delicate ecological relationships, and for heaven's sake, we cannot forget the environment as part of the epidemiological triad. We must emphasize, that we do not think AIDS would ever go from an isolated insect bite, but we think it takes a tremendous exposure over time. The environmental factors must be looked at in respect to AIDS transmission in the tropics.