HIV Disease and Prospects for Antiretroviral Therapy in Africa

The small prospect for extending effective antiretroviral treatment to the HIV-infected populations of African nations and the political, social, and economic factors contributing to this disastrous situation were discussed at the International AIDS Society–USA national CME course by Susan A. Allen, MD, MPH. Her presentation was divided into discussion of "happy delusions," "sad realities," and "competing demands."

HAPPY DELUSIONS

A number of "happy delusions" regarding the ability to institute effective programs for antiretroviral treatment of HIV-infected individuals in Africa continue to be harbored even by those with first-hand experience of the daunting obstacles to such an endeavor. Among these delusions are the beliefs that (1) antiretroviral drugs will be inexpensive enough for use by these populations in the foreseeable future; (2) efficient distribution systems will be established; (3) adherence will be better than it has been for other diseases; and (4) governments and donors will prioritize HIV disease over other major causes of death. Short rejoinders to these hopes include the facts that in Africa, which currently hosts more than 80% of the world's HIV infections, average annual income is approximately US $100; attempts to set up efficient distribution systems for other widespread life-threatening diseases that are more easily treated have had limited success; adherence to simpler regimens than that required for HIV disease treatment has been poor; and there are major health problems that are more urgent or that can be addressed more cost-effectively than HIV disease. However, a fuller appreciation of the magnitude of the barriers confronting effective treatment programs requires appreciation of current environmental and socioeconomic aspects of life in much of Africa.

SAD REALITIES

Factors contributing to the unlikelihood of extending effective anti-HIV treatment to the broad population of infected individuals include (1) regional and national political instability; (2) a combination of growing populations and shrinking resources; (3) existence of other endemic health problems (including childhood diseases, malaria, other sexually transmitted diseases, and tuberculosis); and (4) inefficiency, corruption (5) and apathy at international, national, and local organizational and governmental levels.

Difficulties in establishing effective treatment programs are illustrated by the status of tuberculosis treatment efforts in Africa. Sub-Saharan Africa has among the highest incidence rates of tuberculosis in the world. Although curative drug therapy exists and is relatively inexpensive (approximately US $100 per clinically active case), and despite the existence of both an international donor agency that provides drugs to developing country governments and national programs to diagnose tuberculosis and distribute the drugs, the disease remains woefully undertreated. In part, this is due to infrastructure limitations. Trained personnel and electricity required for diagnostic microscopy and chest x-rays

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are often lacking, as are funds for x-ray film. Drug distribution systems often are weak, primarily as a result of theft of drugs at every point in the distribution system.

Financial incentives also lead to the common practice of patients taking several weeks of medication until they feel

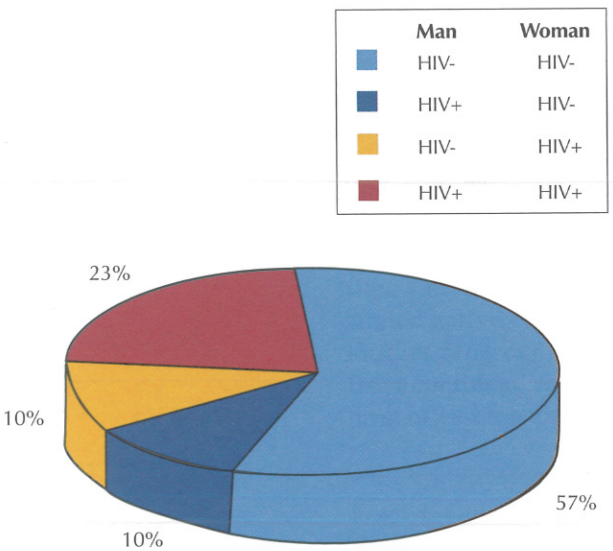

Figure 1. *HIV-positivity rates among 12,000 cohabiting heterosexual couples in Lusaka, Zambia. Adapted from McKenna SL, et al.* AIDS. *1997;11(suppl 1):S103–110.*

better and selling the remainder of their supply. Even with directly observed therapy (DOT), which is associated with the expense of additional personnel- or labor-hours, patients have been known to hold pills under their tongue until they leave the clinic; "wet" pills have a slightly lower street price than "dry" pills. In addition to these infrastructure problems, biologic factors have increased the difficulty of successful treatment, including the HIV-related increase in number of tuberculosis cases, the greater difficulty in diagnosis of HIV-related cases, and the emergence of drug-resistant bacterial strains.

The inability to maintain effective programs for a 6-month treatment course for tuberculosis does not bode well for success of maintaining programs for the extended treatment required for HIV disease. Prospects may be better, however, for programs for short-course treatment to prevent perinatal transmission. Programs for screening and treatment of syphilis in the prenatal care setting, which may serve as a model for perinatal transmission prevention efforts, have generally been successful as a result of the soundness of the infrastructure for prenatal care in most locales. In most of Africa, standard of care in prenatal care programs includes screening for and treatment of syphilis. Current rapid plasma reagin (RPR) positivity prevalence rates in these settings are 5% to 20%. Diagnosis, accomplished with the RPR card, is inexpensive (approximately US $0.20) and does not require electricity or specialized personnel. Curative treatment, achieved with a single dose of penicillin, is also inexpensive (a few cents), and all commodities are supplied by an international donor agency. However, even in this setting, success has not been overwhelming, as a result of reluctance of nursing staff to draw blood and perform card tests and of problems with stocking and distribution of reagents resulting from theft.

Assuming effective treatment programs were feasible, it is rational to believe that efforts to widely implement HIV testing and counseling in order to prevent transmission might be undertaken or maintained. Initial studies by Dr Allen and colleagues conducted in Rwanda showed that testing and counseling were effective in preventing heterosexual transmission of HIV. Currently, Dr Allen and colleagues are testing and counseling cohabiting heterosexual couples in Lusaka, Zambia. Heterosexual couples constitute 90% of the adult population of urban areas in Zambia. Lusaka has a population of approximately 2 million, with testing in prenatal care clinics indicating a HIV seropositivity rate of 25% to 30%. Community workers publicize the program and approximately 20 couples at a time are brought to the testing center, where 2 HIV tests are performed. Lunch is provided while results are obtained; after being informed of test results and receiving counseling, the couples are provided with bus fare home. Approximately 12,000 couples have undergone testing, with results showing 57% of the couples with 2 HIV-seronegative partners, 23% with 2 HIV-seropositive partners, and 20% discordant for infection, with equivalent proportions of male and female partners in the discordant couples testing HIV-positive (Figure 1). The mean duration of union for these couples is approximately 5 years and greater than 97% have children together. Testing and counseling, including provision of condoms, have reduced HIV acquisition/transmission rates among concordant-seronegative couples from approximately 3% to approximately 0.5% per year and transmission rates in discordant couples from 20% to 25% to less than 10% per year. The effectiveness of such a program has recently been confirmed in a 3-country randomized, controlled trial conducted by Coates and

Testing in approximately 12,000 couples in Lusaka, Zambia, indicates that 23% of the couples have 2 HIV-seropositive partners and 20% of the couples are discordant for infection

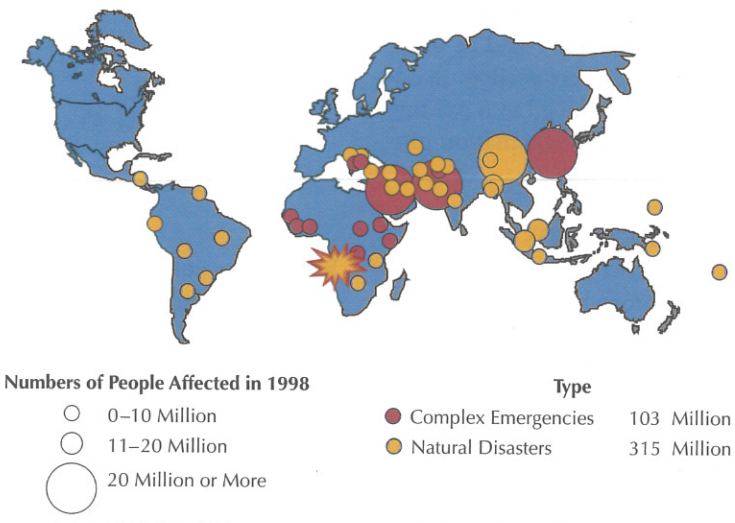

Figure 2. *Number and location of peoples affected by natural disasters or current complex emergencies (combination of war, natural disaster, or environmental problems) in 1998. Adapted from the World Health Organization, http://www.who.int/eha/emergenc/soe.*

colleagues. With the use of rapid testing (at a cost of less than US $1 per kit), the cost of prevention of 1 case of HIV infection via a program targeting couples is calculated to be US $75 (compared with an approximately 3-fold greater cost for short-course antiretroviral treatment to prevent 1 case of maternal-child transmission).

Although international and bilateral agencies endorse the concept of such programs, they are unwilling to provide funding, and many local governments currently are cutting programs because of lack of resources. The primary reasons for reluctance among potential donors appear to be the desire to avoid programs that involve recurring costs (eg, salaries) and commodities, and the desire to avoid the responsibility attendant upon identification of HIV-infected persons. Donor agencies and governments are fearful of backlash from the HIV-seropositive constituency and activist groups likely to form once knowledge of infection status is widespread. Further, many think that it is too late for anything to be done for the adult population, and that prevention efforts should focus on youth.

With all of this in mind, it appears that the best solution for preventing further spread of HIV infection and a disastrous impact on subsequent generations is an HIV vaccine. Vaccination programs have had a high degree of success in developing nations. The vaccine would be inexpensive and could be given without HIV testing or counseling. In addition, it could be integrated into existing prenatal and childhood vaccination programs.

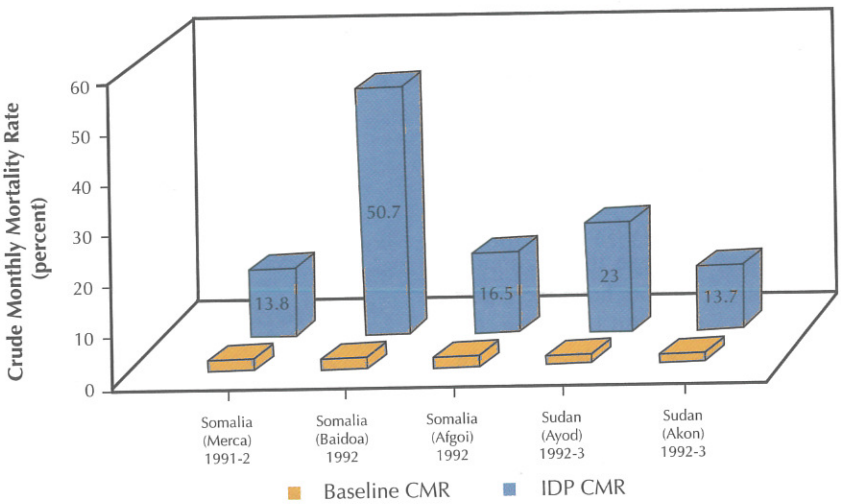

Figure 3. *Increases in crude monthly mortality rates among internally displaced persons (IDP) during conflicts in Somalia and Sudan in early 1990s. CMR indicates deaths per 1000 per month. Adapted from the World Health Organization, http://www.who.int/eha/emergenc/soe.*

Major demands competing with HIV disease prevention and treatment efforts are those created by natural disasters and war

COMPETING DEMANDS

A number of factors have conspired to keep the HIV epidemic at a lower priority for many African nations, including the high number of natural disasters affecting the continent. Statistics for 1988 to 1992, for example, show that there were 66 events that caused damage amounting to more than 1% of a nation's gross national product and 139 events that affected more than 1% of the population. The costs of natural disasters alone in Africa have averaged US $87 billion per year over the past 25 years; by comparison, international donor agencies provide approximately US $3 billion per year to African nations.

War and its consequences constitute another major factor in the relegation of HIV disease to lower priority (Figure 2). Many of the sub-Saharan African nations are currently embroiled in conflicts, including the current conflict in Congo that threatens to involve multiple surrounding nations, or are in transitional postconflict states. The 1994 genocide campaign in Rwanda claimed 1 million lives in the course of 4 months (ie, more lives than HIV disease is likely to claim in decades) and created an enormous refugee population, with 2 million people crossing Rwanda's borders within several weeks. As related by Dr Allen, who was working in Rwanda during this period, concerns over a disease that may claim a life at some unspecified time in the future pale against the immediacy of such a disaster.

In addition to direct casualties of war, such large movements of people are associated with sharp increases in mortality due to disease (eg, cholera, meningitis). Mortality does not attend only refugee movements, but is also dramatically increased among internally displaced persons. Figure 3 shows the magnitude of such increases during recent upheavals in Somalia and Sudan. These occurrences also have a disastrous impact on social and health care infrastructures. A recent assessment of 171 developing countries in achieving international development goals defined by a combination of health and demographic factors shows that African nations account for 25 of the 34 nations furthest away from these goals, with the majority of these nations currently or recently in-

volved in political conflicts.

These competing demands for resources and the more immediate threats to life reinforce the unlikelihood that antiretroviral treatment will become a reality for the majority of infected individuals in African nations. Although the expense of treatment may decrease markedly in the foreseeable future, the fact that the political and economic status is worsening instead of improving in most countries suggests that treatment will remain out of reach for most. Limited use is likely among some populations in nations with relatively healthy economies (eg, South Africa), but overall, less than 1% of the African population can currently afford to pay for treatment on their own or work for companies willing to pay for it. Some nations that have been involved in conflicts have few individuals remaining who are capable of running a government; in such places, governments are setting aside funds for treatment of infected officials to prolong their life as long as possible. For the remainder of the HIV-infected population, there are no obvious or apparent solutions.

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Suggested Reading

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