Colliding Epidemics: HIV, TB and Other Diseases

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Lessons learned during the global scale-up of HIV treatment can be used to address epidemics of tuberculosis (TB) and non-communicable diseases (NCDs), which have become leading causes of death for HIV-positive people in low- and middle-income countries. Unless additional measures are taken, experts explained on Friday, July 27, at the XIX International AIDS Conference (AIDS) in Washington, DC, there may be some erosion in antiretroviral therapy's ability to prolong the lifespan of an aging global population of HIV-positive people.

A Global View: HIV Care as a Model For Treating Other Illnesses

Two researchers operating mainly in sub-Saharan Africa, Yogan Pillay, PhD, the deputy director general for health in South Africa, and Anthony Harries, MD, senior advisor at the International Union Against Tuberculosis and Lung Disease in Paris, shared the view that with the right adjustments lessons learned during the scale-up of HIV treatment can cross over to reduce the global death rates from HIV/AIDS and a number of other illnesses.

Even though AIDS deaths are still a regular occurrence in many countries and approximately 28 million people living with HIV worldwide are currently not on treatment, over the last decade there has been a significant global reduction in opportunistic infections and deaths attributed to AIDS. To give a sense of this unprecedented global scale-up in HIV treatment, Pillay explained that 20 million South Africans have been tested for HIV in the past 20 months, and the country has put 1.7 million people on antiretroviral treatment since 2004.

In this context, Pillay encouraged low- and middle-income countries to promote the sustainable development of their health infrastructure and interventions. Pillay said that countries can translate lessons learned from the HIV treatment scale-up into prolonged life expectancy for the people living in these countries—with significant benefits for HIV-positive people. He recommended integrating different types of health-related services, promoting country ownership, and committing more funding while improving efficiencies, such as technical and structural efficiencies. Pillay also emphasized the need to increase spending on high-impact interventions.

The Limits of a Non-Integrated Approach

While researchers have tracked the life-expectancy benefits of antiretroviral treatment and

concluded that people who go on treatment early gain the greatest life-expectancy benefit, they are also beginning to outline the challenges of continuing to increase the lifespan of an aging population of people living with HIV, particularly in low- and middle-income settings.

New research suggest that the current scale-up of HIV treatment may see diminished results in its ability to continue reduce deaths and prolong life expectancy— especially if the impact of other illness is not factored into national and global strategies. For example, between 8 percent and 26 percent of patients starting antiretroviral treatment in Africa still die in the first year of therapy, and both diagnosed and undiagnosed TB are major causes of this mortality, doctor Harries explained. TB is still the number-one cause of death globally for HIV-positive people. Internationally, approximately 350,000 people with HIV-associated tuberculosis died 2010, which is especially tragic since both conditions are treatable.

In Europe and North America, more than half of all HIV-positive people on treatment are now dying prematurely from non-communicable diseases (NCDs), such as cardiovascular disease, non-AIDS cancers, diabetes, chronic respiratory disease and other illnesses not directly related to AIDS, according to a 1996-2006 Antiretroviral Therapy Cohort Collaboration (ART-CC) study. The numbers are also rising in middle- and low-income settings.

To demonstrate the need for an integrated approach to HIV care, Harries explained the three underlying reasons for HIV-associated TB deaths. First, among people with HIV/AIDS, tuberculosis was not diagnosed and not treated. Second, patients with TB were not tested for HIV and co-infection was not diagnosed or treated. Lastly, neither HIV nor TB was diagnosed or treated—or diagnosis and treatment came too late.

To stop or greatly reduce these deaths, Harries proposed that tuberculosis deaths need to be approached just as aggressively and strategically as AIDS deaths. To greatly reduce TB deaths among people living with HIV, Harries proposes early antiretroviral therapy, the introduction of isonazid preventive therapy for TB, and better, cheaper and expanded diagnostic testing for TB. Harries also recommended locating HIV and TB treatment within the same facilities (with mandatory infection control standards so that TB is not passed from one person to another). Harries added that it’s important that patients do not have to walk miles from one service to another, because this may disrupt their care. Although Harries’s research is TB-focused, the type of integrated approach he proposed is also gaining popularity among researchers focused on HIV/AIDS in the United States.

Other Illnesses Associated With Aging With HIV

Judith Currier, MD, MPH, the co-director of the Center For AIDS Research at University of California, Los Angeles (UCLA), offered a global epidemiological picture of epidemics of HIV and NCD colliding. First, she showed that the demographic trend of people living with HIV in many countries is shifting (or has already shifted) to people over 50, now that HIV-positive people are living longer because of access to antiretroviral treatment. Second, Currier showed evidence of a rising global epidemic of NCDs, which appears to be most acute in regions with high HIV infection rates.

The World Health Organization estimates that 36 million people died globally of NCDs in 2008; 80 percent of these deaths occurred in low- and middle-income countries. Currier explained that NCD epidemics are often fueled by poor nutrition, high levels of tobacco and alcohol use and low levels of physical activity, particularly in urban areas. NCD deaths are projected to increase to 57 million by the year 2030.

Since geographic proximity isn't enough to demonstrate that these epidemics will affect one another, Currier cited several studies that show that patients being treated for HIV are at higher risk for several NCDs, including cardiovascular disease, chronic obstructive pulmonary disease, non-AIDS cancers, diabetes—as well as illnesses that aren't considered traditional NCDs, such as osteoporosis, frailty, cognitive disorders, chronic liver disease and chronic renal disease.

There is also mounting evidence that aging with HIV increases the risk of comorbidities—and in many cases the comorbidity is an NCD. Currier presented a graph that tracked comorbidity in relation to older age among two separate groups, HIV-negative people and HIV-positive people. The graph illustrated that over the age of 50, HIV-positive people were more likely to have one or multiple comorbidities when compared to same-age HIV-negative people. This disparity became more pronounced at older ages. For example, HIV-positive people aged 60 to 65 were approximately twice as likely to have three or more comorbidities.

Why is old age liked to greater risk for comorbidities for HIV-positive people? Currier explained that normal and abnormal aging is already associated with progressive changes to the immune system, and in aging HIV-negative people there is a reduction in number of naïve t-cells and a decline in their proliferative potential. Seniors also generally experience an expansion of senescent t-cells and an increased production of cytokines like IL-6, which can also have negative health effects. Currier proposed that aging with HIV—even on treatment—may deal a "double hit to the immune system," which may underlie the increased risk for other non-communicable chronic diseases.

How to Lower NCD Risk Among People Aging With HIV

When it comes to reducing HIV-positive patients' risk for NCDs, Currier highlighted the central importance of early HIV diagnosis and treatment. "We need to remember that early diagnosis of HIV and prompt entry to care is going to be an important component of reducing the long-term risk for NCDs," Currier said.

Putting opportunistic infections aside, she further explained the biological process by which untreated HIV can do lasting damage to the body through inflammation and immune activation, which in turn may pose an increased risk of various cancers, coronary disease, stroke, coagulation disorders; untreated HIV may also increase the risk for atherosclerosis and osteoporosis. Drawing this medical lesson into an intervention strategy, Currier focused on the need expand HIV testing, to start people on antiretroviral treatment between the CD4 count of 350 and 550, and to monitor and screen HIV-positive patients and identify those who may be at the highest risk for NCDs.

Changing lifestyle factors was another significant way HIV-positive people may be able to reduce the risk of developing NCDs, according to Currier. She showed that tobacco use is prevalent in many HIV-positive populations and has been linked to increased risk for cancer, cardiovascular disease, bone loss and impaired neurocognitive function. In one study, approximately 40 percent of one U.S. cohort of HIV-positive people were smokers, which is twice the rate of the general population. A second study showed that smokers had a reduced response to antiretroviral treatment compared to non-smokers. Currier's conclusion: If you're an HIV-positive smoker, you may reap additional health benefits from quitting as soon as possible.

Interventions to help people living with HIV reduce saturated fat and salt intake and get regular aerobic and resistance exercise should also be encouraged as ways to promote overall health and protect against NCDs, Currier said. There have already been recommendations made for people living with HIV over the age of 50 to get aerobic exercise three days per week for 20 to 40 minutes, including stretching and resistance training—all of which can be done without a gym membership.

Currier voiced the need to continue to track how the side effects of different anti-viral medications are affecting patients' long-term health so care providers can promote the safest drugs globally. She also discussed the need for researchers to evaluate the treatment for NCDs in the setting of HIV, since there is much that can still be learned about the long-term interactions of different treatments and drugs. "The NCD and HIV worlds are often competing against each other," Currier added. "I think the secret is to gang up on the problem rather than each other." On this last point, all three researchers seemed to be in agreement.

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