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HIV/TB Coinfection: Basic Facts

HIV/TB: The Dual Epidemic

HIV/AIDS and tuberculosis (TB) are commonly called the “deadly duo” and referred to as HIV/TB. HIV weakens the immune system and so people are more susceptible to catching TB if they are exposed. People with HIV/AIDS are up to 50 times more likely to develop active TB in a given year than HIV-negative people. TB bacteria accelerate the progression of HIV to AIDS.

Some TB infections are “latent,” meaning that a person has the TB-causing bacteria but it is dormant. A person with latent TB is not sick and is not infectious. However, latent TB can progress to “active” TB. “Active” TB infection means that the TB bacteria are multiplying and spreading in the body. A person with active TB in their lungs or throat can transmit the bacteria to others. Symptoms of active TB include a cough that lasts several weeks, weight loss, loss of appetite, fever, night sweats, and coughing up blood.

TB is one of the few HIV/AIDS-associated infections that can be spread to others just by breathing the same air. The TB bacteria are virulent enough that they can make even healthy adults and children sick, who in turn can spread it to others. If there are a lot of HIV-infected people in the community, the vicious cycle results in more and more people with TB.

Where the Two Meet

Two billion people are infected with TB bacteria worldwide. Each year – 8 million to 10 million new people contract TB and 2 million die from it. Only about 10 percent of people with TB develop active TB during their lifetimes but this percentage is increasing – largely due to the increased infections among people with HIV/AIDS.

Nearly 40 million people are living with HIV infection worldwide and as many as one-third are co-infected with TB. A majority of TB cases in people living with HIV/AIDS occur in sub-Saharan Africa, where up to 80 percent of TB patients may be co-infected with HIV.

Without proper treatment, 90 percent of people living with HIV die within months of contracting TB. TB is the leading cause of death for people with HIV/AIDS in Africa and one of the leading causes of death worldwide.

More than 2 million children were living with HIV/AIDS at the end of 2006 and a majority – 2 million – were in sub-Saharan Africa, where TB case loads are burgeoning.

The 15 focus countries* of the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR) comprise 21 percent of the global TB burden and 24 percent of the world’s annual TB deaths. In Botswana, 70 percent of new adult TB cases are HIV-positive; in South Africa, 58 percent; and in Zambia, 55 percent.

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Diagnosing and Treating Adults with HIV/TB

TB is difficult to diagnose in people living with HIV because the commonly used diagnostic tools are less able to detect the TB bacteria in them. People with HIV are more likely to develop TB both inside and outside of the lungs, also making the diagnosis more difficult, and the disease more deadly.

Looking at coughed up sputum under a simple light microscope is the most widely used diagnostic tool for TB in resource poor settings. The test is more than 100 years old and detects fewer than 60 percent of all new TB infections and as few as 20 to 35 percent of HIV/TB infections. Countries like the US and Europe replaced these outdated methods with better tests decades ago, and today have a small fraction of the cases of TB as do poorer countries.

Active TB can be treated and cured in people with HIV/TB, if it is diagnosed and treated before the disease becomes too severe. Five drugs are currently available to treat active TB – isoniazid, rifampin, pyrazinamide, ethambutol, and streptomycin. A combination of these drugs is required or the bacteria will develop drug-resistance. The TB drugs we use today were discovered in the 1950's, require 6-9 months of continued treatment to be effective and have serious liver toxicity issues. A new TB therapy has not been developed for more than 40 years.

Successfully treating HIV/TB treatment is complicated. There are drug-to-drug interactions between the complex drug regimens required to treat both diseases, and paradoxically, people with HIV/AIDS can develop something called Immune Reconstitution Inflammatory Syndrome (IRIS), an over-reaction of the immune system that inflames TB. Studies are underway to determine the best antiretroviral drugs to administer, how to manage IRIS, and the optimal duration of TB treatment in HIV patients. These studies are critically important because successful TB treatment can prolong the lives of people with HIV by at least two years, and probably longer if they get started on AIDS medicines.

If someone has been exposed to TB, but is not yet sick, active TB can be prevented with a 6 to 9-month course of TB preventive therapy. Preventive therapy reduces the risk of people with HIV/TB developing active TB by as much as 60 percent.

Special Considerations for Children with TB/HIV

Children are extremely vulnerable to contracting TB from adults in the household. TB is not usually transmitted from child to child.

Children 5 years old and younger are at very high risk for developing active TB because the immune system is less developed. Children with HIV are at increased risk for contracting TB and specifically for developing TB meningitis, which often results in deafness, blindness, paralysis, and mental retardation.

Diagnosis of TB in children is difficult because most children are unable to develop enough sputum for the laboratory to confirm TB infection.

Pediatric drug formulations are not available for TB and few are available for HIV.

The Threat of Drug Resistance

If a TB drug regimen is not completed or is taken sporadically, TB bacteria can develop resistance to the drugs so the drugs are no longer effective at killing the bacteria. People with HIV/AIDS are at even greater risk for developing drug-resistance because they may not absorb the medicines as well as others. Also, because their immune system is damaged, it is unable to help the TB medicines get rid of the TB bacteria. The threat of active tuberculosis, including drug resistant TB, continues for HIV patients, even after they are successfully managed on HIV antiretroviral therapy.

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Multidrug-resistant TB (MDR TB) can develop when bacteria become resistant to the two most powerful first line drugs (isoniazid and rifampicin). When this happens, second-line drugs are required, which are more expensive and have more side effects.

Extensively drug-resistant TB (XDR TB) can develop when second-line therapies are not used properly and the bacteria develop resistance to them as well. Treatment options are extremely limited for people with XDR TB and the risk of death is extremely high—particularly for people living with HIV/TB.

At least 400,000 individuals are estimated to be infected with MDR TB and more than 26,000 are infected with XDR TB worldwide. These data clearly under-represent the number of individuals infected with resistant tuberculosis, given the absence of population-based data and the high burden of disease in the southern African region, where only South Africa has the laboratory capacity to diagnose XDR TB.

A Call for Resources for Tuberculosis and HIV-TB Co-infection

The World Health Organization's Global Plan to Stop TB 2006-2015 identifies responding to the HIV/TB co-epidemic as a key activity, and calls for funding of \$7 billion over 10 years to do so, of the total \$56 billion needed to fight TB.

Global investment in tuberculosis research and development in 2005 totaled only \$393 million, including basic and applied research, diagnostics and drugs research, vaccine research and operational research.

U.S. PEPFAR supports national TB and HIV/AIDS programs that integrate HIV prevention, treatment and care activities into TB services, including support for TB care and treatment. PEPFAR priorities for HIV/TB interventions are:

- routine screening for TB
- HIV counseling and testing for clients at TB facilities
- diagnosis and treatment of people living with HIV/AIDS with active TB
- ensuring that cross-referrals are made for TB patients to provide adequate care and treatment for HIV/AIDS, including antiretroviral treatment and cotrimoxazole

In fiscal year 2006, PEPFAR funding for HIV-TB co-infection in its 15 focus countries* was \$48.6 million or 2.8 percent of PEPFAR's program budget. HIV-TB funding through PEPFAR is expected to increase to \$120 million in FY 2007, or 3 percent of the program budget.

TB and HIV Collaboration and Integration: Opportunities and Challenges

TB treatment programs have been built over many decades. More recently, strong HIV/AIDS service programs and now treatment programs are being developed. Unfortunately, too often TB and HIV programs are not working together. Many times staffing, training and research endeavors approach HIV and TB as two wholly independent problems. This vertical approach, amplified by disease-specific funding streams, has served as a barrier to collaboration and integration to address HIV-TB co-infection that occurs in a single patient and that threatens public health as a co-epidemic.

Various models of integration and collaboration between HIV and TB program activities have been adopted in Malawi, South Africa and Zimbabwe, among other countries. More models and greater dissemination of models are needed to demonstrate ways in which HIV and TB services can positively interact. Operational research is urgently needed to assess different approaches to the care of HIV-TB co-infected patients.

* Botswana, Cote D'Ivoire, Ethiopia, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Vietnam, Guyana, Haiti

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Information in this fact sheet was compiled from the following sources:

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