Combination therapy as good as old regimen to prevent full-blown TB in people with/without HIV

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Johns Hopkins and South African scientists have further compelling evidence that new, simpler and shorter treatments with antibiotic drugs could dramatically help prevent tens of millions of people worldwide already infected with the bacterium responsible for tuberculosis, and especially those co-infected with HIV, from developing full-blown TB. That population includes as many as 22 million in sub-Saharan Africa who are already HIV positive and at high risk of also picking up TB, which is endemic to the region, plus another 50,000 in the United States who are similarly HIV positive and at high risk of catching the lung infection.

Results of a study, to be published in *The* New England Journal of Medicine online July 7, by the international team of scientists found the most streamlined combination -- a high-dose pairing of 900 milligrams each of the newer antibiotic rifapentine and traditional isoniazid once weekly for three months -- worked just as well or even better than 300 milligrams of isoniazid taken daily for six months or longer, and widely considered the gold standard of care.

"This new, simpler treatment regimen with rifapentine and isoniazid is highly effective and could transform therapy for latent tuberculosis in both those co-infected with HIV and those not," says study senior author Richard Chaisson, M.D., a professor of infectious diseases at the Johns Hopkins University School of Medicine and founding director of its

Center for Tuberculosis Research.

"New treatment options are urgently needed to help control TB globally, and simpler regimens will substantially increase the number of people receiving therapy," says Chaisson, who points out that fewer than 1 percent of those infected and most likely to develop full-blown TB are receiving drug treatment because of inconvenience, drug side effects and difficulty finding health clinics close to where they live.

Chaisson says the latest study in 1,148 South African men and women co-infected with HIV, and another recent study, in which he was also involved, in more than 8,000 men and women in the United States, Canada, Spain and Brazil who mostly were HIV free, show success for the first new treatment option since rifapentine, marketed as the drug Priftin, was approved for use in the United States in 1998. He adds that the results represent the most significant advance in preventing the disease since isoniazid was first proven effective in treating the disease in the 1950s.

TB is the leading cause of death among people co-infected with HIV, the virus that causes AIDS, leading to some half-million deaths annually among those co-infected.

Chaisson says the streamlined, weekly regimen is much easier for patients to follow, with 95 percent having completed treatment in this study, while traditional daily and longer isoniazid therapy shows a compliance rate of about 60 percent or less in other studies and in practice. This is important, he notes, because isoniazid does not work if treatment is interrupted and people stop taking it as prescribed.

Such obstacles in treatment, as well as fears about producing drug-resistant bacteria, in addition to drug toxicity and liver damage in people who also have HIV, probably explain why the vast majority of

physicians in South Africa do not prescribe isoniazid treatment alone to prevent TB, Chaisson says, even though it is therapy recommended by the World Health Organization.

In the latest study, participants were monitored for three to six years to see whose TB infections stayed dormant, or latent, and whose did not. Some 3.1 percent developed active TB or died each year while taking the shorter drug regimen, compared to 3.6 percent in those using the traditional isoniazid approach. Researchers say that without treatment, death rates among those co-infected with both the TB bacterium and the virus that causes AIDS would be double, between 5 percent and 10 percent.

In addition to the rifapentine-isoniazid combination, the Hopkins-South African team found that two more shortened drug regimens kept TB in check just as well as isoniazid alone.

A combination of 600 milligrams of rifampin – an antibiotic in the same rifamycin group as rifapentine and used to treat TB disease on its own since 1968 -- when taken with 900 milligrams of isoniazid twice weekly for three months was also as effective in keeping the disease at bay. This group had a 2.9 percent annual rate of developing TB or death, a number statistically similar to the group taking only isoniazid.

Those taking traditional isoniazid therapy, 300 milligrams daily for up to six years, had a 2.7 percent annual rate of developing TB or death.

Observed side effects were mild, Chaisson says, with some liver damage occurring in 20 percent of study participants taking isoniazid for the longer term, and in about 5 percent of those using alternative regimens.

However, the key problem with both rifamycin-based medications, Chaisson acknowledges, is that they break down in the liver other drugs,

such as protease inhibitors, widely used to fight HIV. Because of this complication, study participants taking either rifamycin drug were not allowed to also take protease inhibitors and could enroll in the study only if they were not already on or did not require immediate antiretroviral drug therapy.

Only two study participants taking the simpler regimens developed TB bacterial strains resistant to their antibiotics, putting to rest researchers' initial concerns that the study would lead to widespread development and outbreaks of a more potent form of the disease.

"As a result of our research, physicians should feel more comfortable with recommending a simplified treatment approach, knowing now that their patients are more likely to complete treatment as directed and remain disease free," says study co-investigator and infectious disease specialist Neil Martinson, M.B., M.P.H.
"These treatment options are much simpler than anything else we have," adds Martinson, an assistant professor at Johns Hopkins and deputy director of the perinatal HIV research unit in Soweto, South Africa, where the study took place.

Chaisson and his international colleagues next plan to gauge the effectiveness of even shorter regimens, such as high doses of rifapentine and isoniazid daily, but only for one month. He says the aim of his research is to "open up" access to drug therapies for everyone with TB, as a means of better controlling the disease.

Experts estimate that 2 billion people worldwide are infected with TB, caused by Mycobacterium tuberculosis, 10 million of whom fall ill each year.

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