Medical Xpress

Giving preventive drug to men at high risk for HIV would be cost-effective, study shows

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A once-a-day pill to help prevent HIV infection could significantly reduce the spread of AIDS, but only makes economic sense if used in select, high-risk groups, Stanford University researchers conclude in a new study.

The researchers looked at the cost-effectiveness of the combination drug tenofovir-emtricitabine, which was found in a landmark 2010 trial to reduce an individual's risk of HIV infection by 44 percent when taken daily. Patients who were particularly faithful about taking the drug reduced their risk to an even greater extent — by 73 percent.

The results generated so much interest that the Stanford researchers decided to see if it would be cost-effective to prescribe the pill daily in large populations, a prevention technique known as pre-exposure prophylaxis, or PrEP. They created an economic model focused on men who have sex with other men, or MSM, as they account for more than half of the estimated 56,000 new infections annually in the United States, according to the Centers for Disease Control and Prevention.

"Promoting PrEP to all men who have sex with men could be prohibitively expensive," said Jessie Juusola, a PhD candidate in management science and engineering in the School of Engineering and first author of the study. "Adopting it for men who have sex with men at high risk of acquiring HIV, however, is an investment with good value that does not break the bank."

For instance, using the pill in the general MSM population would cost $495 billion over 20 years, compared to $85 billion when targeted to those at particularly high risk, the researchers found. The study will be published in the April 17 issue of the *Annals of Internal Medicine*.

Senior author Eran Bendavid, MD, assistant professor of medicine in the School of Medicine, said the results are a departure from a previous study, which found PrEP was not cost-effective when compared with other commonly accepted prevention programs. The new Stanford study differs in a few important respects, taking into consideration the decline in transmission rates over time as more individuals take the pill. The Stanford team also assumed individuals would stop taking PrEP after 20 years, not stay on the drug for life, as the previous study had assumed.

The pill combination, marketed under the brand name Truvada, is widely used for treating HIV infection. But it wasn't until a landmark trial, published in the New England Journal of Medicine in November 2010, that individuals and their doctors began to seriously consider using the drug as a preventive therapy. The drug's maker, Foster City, Calif.-based Gilead Sciences Inc., has filed a supplemental new drug application to market it for prevention purposes.

The CDC issued interim guidelines on the drug's use in January 2011, suggesting that if practitioners prescribe it as a preventive measure, they regularly monitor patients for side effects and counsel them about adherence, condom use and other methods to reduce their risk of infection.

In developing their model, the Stanford researchers took into account the cost of the drug — about $26 a day, or almost $10,000 a year — as well as the expenses for physician visits, periodic monitoring of kidney function affected by the drug, and regular testing for HIV and sexually transmitted diseases.

"We're talking about giving uninfected people a drug that has some toxicities, so it's crucial to have them monitored regularly," Bendavid said, who is also an affiliate of Stanford Health Policy, part of the Freeman Spogli Institute for International Studies.

Without PrEP, the researchers calculated there would be more than 490,000 new infections among the MSM population in the United States in the next 20 years. If just 20 percent of these men took the pill daily, there would be nearly 63,000 fewer infections.

However, the costs are substantial. Use of the drug by 20 percent of the MSM population would cost $98 billion over 20 years; if every man in this group took PrEP for 20 years, the costs would be a staggering $495 billion.

Given these figures, the researchers looked at the option of giving PrEP only to men who are at high risk — those who have five or more sexual partners in a year. If just 20 percent of these high-risk individuals took the drug, 41,000 new infections would be prevented over 20 years at a cost of about $16.6 billion.

At less than $50,000 per quality-adjusted life year gained (a measure of how long people live and their quality of life), that strategy represents relatively good value, according to Juusola.

"However, even though it provides good value, it is still very expensive," she said. "In the current health-care climate, PrEP's costs may become prohibitive, especially given the other competing priorities for HIV resources, such as providing treatment for infected individuals."

She said the costs could be significantly reduced if the pill is found to be effective when used intermittently, rather than on a daily basis. Current trials are examining the effectiveness of the drug when used less often.