

Study examines cost-effectiveness of HIV monitoring strategy in countries with limited resources

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In a computer-based model evaluating the benefits and costs of three types of HIV disease monitoring strategies, early initiation of antiretroviral therapy and monitoring using the CD4 count, a measure of immune system function, instead of based on symptoms appear to provide health benefits in low- and middle-income countries, according to a report in the September 22 issue of *Archives of Internal Medicine*.

"Two-thirds of the world's HIV-infected population resides in Africa, and most of the world's new infections occur in low- and middle-income countries," the authors write as background information in the article. Although progress has been made in increasing access to treatment, only 20 percent of adults who need highly active antiretroviral therapy (HAART) receive it. Among those who do, treatment is often managed without regular checks of CD4 counts (lower counts indicate less immune system function) or viral loads; this lack of monitoring may decrease HAART's effectiveness. "Therefore, key questions in the management of HIV infection in resource-constrained settings are whether and how to monitor persons infected with HIV and when to initiate HAART."

Eran Bendavid, M.D., of Stanford University, Calif., and colleagues developed a computer model to compare three types of HIV monitoring strategies for starting, switching and stopping HAART: those based on symptoms, those based on CD4 counts and those that combine CD4

counts with viral load. "We used clinical and cost data from southern Africa and performed a cost-effectiveness analysis," the authors write. "All assumptions were tested in sensitivity analyses."

Compared with approaches based on symptoms, monitoring CD4 counts every six months and beginning treatment when CD4 counts reached 200 cells per microliter was associated with an additional 6.5 months of life expectancy and a reduction in lifetime medical costs of \$464 per person. CD4-based strategies in which treatment was initiated at the higher threshold of 350 cells per microliter provided an additional 5.3 months of life expectancy at a cost-effectiveness of \$107 per year gained compared with the 200-per-microliter threshold. The increased life expectancy with CD4 count monitoring was associated with a large decrease in opportunistic infections—314 fewer during the course of 1,000 patients' lifetimes.

"Monitoring viral load with CD4 was more expensive than monitoring CD4 counts alone, added two months of life and had an incremental cost-effectiveness ratio of \$5,414 per life-year gained relative to monitoring of CD4 counts," the authors write. In sensitivity analyses, monitoring by CD4 count became more cost-effective as the average costs of inpatient care in a given country increased, because the monitoring was associated with fewer hospitalizations for opportunistic infections. The cost-effectiveness of monitoring viral load depended on the cost of the test in that area as well as the rates of virologic failure, which occurs when treatment fails to reduce the levels of virus in a patient's blood.

"Our analysis shows that, where HAART is available, CD4 count monitoring with earlier treatment initiation provides a substantial increase in life expectancy, which in some settings may be achievable while reducing total expenditures for HIV infection," the authors write. "As the number of persons receiving HAART increases, the potential health benefit and cost savings from use of CD4 monitoring will also

increase."

Source: JAMA and Archives Journals

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