Medical Xpress

Blood cell test for HIV treatment monitoring is cheaper but just as effective

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(Medical Xpress) -- A cheaper laboratory test that helps guide anti-retroviral drug treatment for people with HIV/AIDS may be just as effective as a more sophisticated test, a group of international researchers has found – a discovery that could be particularly important in rural Africa.

While the findings by researchers in the United States, Canada and Uganda must still be confirmed through additional clinical trials, the authors said, they suggest that the more expensive method—called viral load testing—may not provide a substantial benefit over the cheaper and older one, known as CD4+ testing.

“No one had directly looked at this question in Africa before,” said James G. Kahn, MD, MPH, a professor of health policy, epidemiology, and global health at the University of California, San Francisco (UCSF) who led the economic aspect of the research. “If it’s true that you are not getting much clinical gain for the buck, maybe we should focus our attention on CD4+ testing."

"For a modest cost, you get an extra year of life,” he added.

The study, published in the Dec. 2, 2011 issue in the British Medical Journal, compared the two most common tests for HIV/AIDS disease progression head-to-head and alongside a third strategy, which relied on close clinical monitoring alone, with no testing. Laboratory monitoring with CD4+ gave the patients in the trial better outcomes than clinical

monitoring alone, but adding viral load monitoring provided no advantage.

What the Tests Measure

Both tests rely on taking routine blood samples from patients and then analyzing the blood for markers of the virus or of immune system functioning. The cheaper test looks at the abundance in the blood of human immune cells, known as CD4+ cells. The more expensive test samples the blood for viral load, or copies of viral genomes.

Viral load measures the amount of virus a person has in his/her bloodstream. It is closely connected with the state of infection, and in general, as people become very sick with HIV/AIDS, their viral load increases. When people with AIDS are given antiretroviral drugs for the first time, their viral load often drops dramatically as their health improves.

Measuring CD4+ cells in the bloodstream provides another view of HIV disease status. The CD4+ test directly measures the abundance of the helper T cell, an of immune cell in the bloodstream distinguishable because they are the only ones that carry the CD4 marker.

HIV targets and kills these types of cells during the course of infection and, as people become sicker, their CD4+ cell count generally goes down. When people with AIDS are given antiretroviral drugs for the first time, their CD4+ count often rebounds.

Doctors treating people with HIV/AIDS have used CD4+ cell counts to guide treatment since the early 1990s. However, the standard of care in the United States in recent years has been for doctors to monitor the disease via the more sophisticated and expensive viral load test. CD4+ counts are still measured routinely, but viral load tests are generally used

to guide treatment decisions, following the theory that suppressing the virus is the goal of therapy.

The Trial in Uganda

The clinical trial was part of the Home-Based AIDS Care (HBAC) program, designed to deliver high quality AIDS care to the largely agricultural Tororo District in eastern Uganda, where more than one in 20 people are infected with HIV.

The care is home-based and delivered by community health workers who periodically visit patients, gauge their symptoms, and provide antiretroviral therapy as needed. The current study was based on the health outcomes of 1,045 people receiving this sort of care.

As part of the trial, the clinical research team considered the difference in mortality and disability between patients whose treatment was guided in one of three ways: by CD4+ counts, viral load testing and CD4+ counts, and with no laboratory monitoring at all. Then Kahn and his colleagues translated these findings into years of life gain and costs, during the trial and projected into future years.

Patients in the trial were routinely visited and tested several times a year over the course of the trial. Kahn and his colleagues measured the cost effectiveness of the three health monitoring methods.

What they found was that treatment for those monitored through either test was more expensive because of the cost of laboratory monitoring. For CD4+ monitoring the costs were lower ($5 per test, versus $30 per test for viral load), and offset some by a decreased need for expensive second line antiretroviral drugs.

The analysis also showed that viral load testing provided little or no

clinical benefit over monitoring CD4+ counts alone and CD4+ counts proved to provide a substantial benefit at a modest cost.

The study estimated a cost of $174 per added healthy year of life for using the CD4+ test, versus more than $5,000 per added healthy year of life for viral load monitoring. By comparison, anti-retroviral therapy itself costs about $600 per added healthy year of life.

The report also calculated the health benefit of investing in expanded antiretroviral therapy instead of viral load testing. With $100 million to spend on HIV, putting the money into antiretroviral therapy with CD4+ testing rather than viral load testing would add 36,000 healthy life years.

“Viral load monitoring is extremely expensive,” Kahn said. “If you want to spend money well, you appear better off spending it on antiretroviral drugs.”

The article, “CD4 cell count and viral load monitoring in patients undergoing antiretroviral therapy in Uganda: cost effectiveness study,” by James G Kahn, Elliot Marseille, David Moore, Rebecca Bunnell, Willy Were, Richard Degerman, Jordan W. Tappero, Paul Ekwaru, Frank Kaharuza and Jonathan Mermincan be viewed here: www.bmj.com/content/343/bmj.d6884 .

Provided by University of California, San Francisco

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