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Potential savings by reduced CD4 monitoring in stable HIV patients on antiretrovirals

Emily P. Hyle, MD^a, Paul E. Sax, MD^b, and Rochelle P. Walensky, MD MPH^a

^aDivision of Infectious Diseases, Massachusetts General Hospital, Boston, MA

^bDivision of Infectious Diseases, Brigham and Women's Hospital, Boston, MA

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To the Editor

The appropriate monitoring of chronic disease conditions offers high-yield opportunities to improve the value of medical care by reducing excess testing. For people living with HIV/AIDS in the US who are virologically suppressed on antiretroviral treatment (ART), HIV has become a chronic condition. The 2013 Department of Health and Human Services Guidelines for Adult and Adolescent HIV Care recommend CD4 monitoring every 6-12 months “in clinically stable patients with suppressed viral load [no detectable HIV RNA in blood],” although some clinicians perform this test quarterly.¹ Recently published data show that CD4 results in such patients rarely (if ever) influence management.² We sought to estimate how reduced CD4 testing frequency in virologically suppressed patients could contribute to savings at the US population level.

Methods

The Center for Disease Control and Prevention estimates that 28% (336,000) of the 1.2 million people living with HIV/AIDS in the US are virologically suppressed on ART.³ Of these, cohort data suggest that 80% (270,000) meet criteria for sustained suppression on stable ART.⁴ HIV-associated life expectancies in the US and Europe are estimated at 22-34 years after HIV diagnosis.⁵ CD4 test costs range from \$38-\$67/test, depending on whether CD4% is included.⁶ Using these estimates, we examined national costs associated with strategies of CD4 monitoring in this select population.

Results

We project that the current strategy of biannual CD4 monitoring costs \$20.5 million/year at the conservative cost of \$38/test; reducing CD4 monitoring to once/year could result in annual savings of \$10.2 million (Table 1). Many clinicians routinely use the more expensive CD4% (frequently including quantitative CD8 count, \$67/test), in which case annual savings could reach \$18.1 million. Decreasing CD4 frequency could result in a population savings between \$225.7 and \$615.1 million over the lifetime of patients in care, depending on life

Corresponding author: Emily P. Hyle, MD, Medical Practice Evaluation Center, Massachusetts General Hospital, 50 Staniford Street, 9th Floor, Boston, MA 02114-2696, Phone: 617-643-3903 Fax: 617-726-4120, ehyle@partners.org.

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expectancy and CD4 test cost. In clinical practices where routine CD4 are obtained every 3 months, savings associated with annual CD4 would be three-fold higher.

Comment

Reduced frequency of routine CD4 monitoring improves the value of care for all stable, virologically suppressed patients with HIV. Given the emphasis on “re-directed” financing to improve health care spending, the potential \$18 million savings annually might allow for more efficient use of these HIV care dollars. Even greater savings would occur if CD4 monitoring in stable patients were eliminated entirely, which warrants consideration.

The most important question regarding CD4 monitoring is whether reducing its frequency will adversely affect health outcomes by delaying clinical decisions, including initiation of opportunistic infection (OI) prophylaxis or ART modifications. Rarely do virologically suppressed patients with current CD4 $\geq 300/\mu\text{L}$ experience acute OIs or CD4 decline $<200/\mu\text{L}$, the threshold for PCP prophylaxis.² Furthermore, clinicians use HIV RNA as the most sensitive method to monitor for treatment failure,¹ typically due to poor adherence or resistance. CD4 testing would still be indicated for patients no longer virologically suppressed.

Our results likely underestimate the potential savings from reduced frequency of routine CD4 monitoring. Variability in CD4 test results is common due to diurnal variation, medications, infections and laboratory variability. Unexpected decreases in CD4 counts are confirmed by repeat tests, the costs of which are not included in our estimates. Even a single low CD4 value requires extra reassurance to patients regarding its limited importance given ongoing viral suppression.

The number of virologically suppressed HIV patients is growing; as the population eligible for a reduced frequency of CD4 monitoring is increasing, so are the opportunities for savings. Given the still unmet medical needs of people living with HIV/AIDS, a recommendation for at most annual CD4 monitoring in stable, suppressed patients offers a high value opportunity for a wise re-investment of care.

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Table 1
Projected costs with different strategies of CD4 monitoring in routine care for the estimated 270,000 HIV-infected patients on suppressive ART in the US

Frequency (months)	Annual costs ^a		Lifetime costs ^a projected for LE 22 years		Lifetime costs ^a projected for LE 34 years	
	CD4 Test Cost	CD4 Test Cost	CD4 Test Cost	CD4 Test Cost	CD4 Test Cost	CD4 Test Cost
Every 3	\$38	\$67	\$38	\$67	\$38	\$67
Every 6 ^b	41.0	72.4	902.9	1591.9	1395.4	2460.2
Every 12	20.5	36.2	451.4	796.0	697.7	1230.1
Every 12	10.3	18.1	225.7	398.0	348.8	615.1

Abbreviations: HIV, Human Immunodeficiency Virus; ART, antiretroviral therapy; US, United States; LE, life expectancy.

^a All costs in US\$ (millions).

^b Assumed current standard of care.