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Predicting and Monitoring Antiretroviral Adherence

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Predicting and Monitoring Antiretroviral Adherence

Abstract

Antiretroviral therapy is complicated and can be hard to follow. For HIV-infected patients, adhering to a prescribed regimen of antiretroviral therapy provides important individual survival benefits, and also reduces the risk of developing drug resistant viral strains that can infect others. Even patients with initially high levels of adherence to antiretroviral therapy face the challenge of maintaining those levels over time. Ideally, clinicians caring for HIV-infected patients would have some way of predicting which patients are most likely to need help in adhering to a prescribed regimen and an early warning system alerting them to their patients' non-adherence. This Issue Brief summarizes recent studies whose findings may help clinicians predict and monitor their patients' adherence before treatment failure occurs.

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Predicting and Monitoring Antiretroviral Adherence

Editor's Note: Antiretroviral therapy is complicated and can be hard to follow. For HIV-infected patients, adhering to a prescribed regimen of antiretroviral therapy provides important individual survival benefits, and also reduces the risk of developing drug resistant viral strains that can infect others. Even patients with initially high levels of adherence to antiretroviral therapy face the challenge of maintaining those levels over time. Ideally, clinicians caring for HIV-infected patients would have some way of predicting which patients are most likely to need help in adhering to a prescribed regimen and an early warning system alerting them to their patients' non-adherence. This Issue Brief summarizes recent studies whose findings may help clinicians predict and monitor their patients' adherence before treatment failure occurs.

Adherence to drug therapy is vital to HIV treatment success

Sustained antiretroviral adherence has been well-recognized as vital to HIV treatment success. In patients just beginning therapy, the highest levels of adherence (e.g., 95%) are associated with greatest chance of successful viral suppression, and it is likely that similarly high levels are needed to maintain these undetectable viral loads. However, in many patients adherence decreases over time.

- Clinicians currently have little ability to detect declining adherence before the clinical impact appears. Patients may be reluctant to admit that they are missing doses, or may be unaware of the extent of their own non-adherence.

- Once virological rebound due to non-adherence occurs, it is often with resistant virus. Improving adherence at that point may be too late for the current regimen to still have treatment success.

- Detecting non-adherence before treatment failure provides an opportunity to intervene. Identifying risk factors for non-adherence and methods for monitoring adherence remains a research priority in HIV care.

Study examines the link between ongoing adherence and continued treatment success

In one study, Dr. Gross and colleagues sought to determine the magnitude of adherence needed to maintain HIV suppression, and whether pharmacy refill data could be used to predict treatment failure.

- The investigators studied a population of HIV-infected patients in British Columbia, Canada, which has a well-established database for tracking patients' antiretroviral use and clinical status. The study included adults who had started antiretroviral therapy between August 1996 and September 2003, and had successfully achieved undetectable viral loads at some point.

- The study used pharmacy data to track adherence. Adherence was defined as days' supply of medication dispensed divided by the days between prescription refills.

- The study included 1,634 adults who had started triple combination antiretroviral therapy, achieved HIV suppression, and refilled their prescriptions at least three times after suppression was confirmed. Patients were followed until September 2004.

Adherence, measured by refill data, predicts failure to maintain HIV suppression

The study found that high levels of adherence required for maintaining HIV suppression are similar to the levels needed to achieve suppression. But even below the 95% threshold, greater adherence was associated with continued treatment success.

- Overall, adherence was high, with 84.4% of the patients having greater than 95% adherence over the observed period, which was a median of 29 months.

- A total of 606 patients (37.1%) experienced "virological rebound" or treatment failure, with a median time to treatment failure of 22 months.

- After adjusting for other demographic and clinical factors, patients with 95% adherence or less, as measured by pharmacy refill data, were 1.66 times more likely to experience treatment failure than those with greater than 95% adherence.

- As adherence decreased, treatment failure increased. Overall, 34% of patients with greater than 95% adherence had virological rebound, compared to 41% of those with 70%-95% adherence, and 63% of those with less than 70% adherence.

Non-adherence is detectable three months before treatment failure

In a prospective, observational study, Gross and colleagues followed 116 patients for one year to determine if suboptimal adherence can be identified prior to treatment failure during a period of HIV suppression. They measured adherence with microelectronic monitors on medication bottle caps that record when the bottle is opened.

- Patients were recruited from five HIV clinics in Philadelphia from May 2000 to August 2004. The patients were predominantly male, poor, and African-American.

- Only 52% of patients were fully adherent (defined as adherence levels of at least 95%). Over the course of the year, 7 of 116 patients experienced virological rebound. In the three months before treatment failure, this group had a median adherence of 38%, compared to 96% adherence for the group that maintained viral suppression.

- These differences in adherence levels were detectable at 30 days, 60 days, and 90 days before treatment failure occurred.

Financial worries strongly predict poor adherence

In a separate analysis of the same 116 patients, Holmes, Gross, and colleagues examined whether baseline measures of patients' quality of life could predict adherence over time. They considered different aspects of HIV-related quality of life, including overall functioning, sexual function, health worries, medication worries, life satisfaction, and trust in the HIV care provider. The investigators also accounted for an array of sociodemographic and substance use characteristics.

- Compared to patients with at least 95% adherence, patients with poor adherence were more likely to have used alcohol in the past year. Alcohol use has been one of the most consistently identified predictors of antiretroviral adherence in other studies.

- After adjusting for other factors, financial worries were strongly associated with poor adherence. Financial worries included concerns about living on a fixed income, how to pay bills, and having too little money to take care of oneself.

- No other aspect of quality of life was associated with subsequent adherence.

POLICY IMPLICATIONS

These results reinforce the importance of ongoing attention to adherence in the care of HIV patients and highlight promising strategies for early identification of suboptimal adherence.

- Clinicians should recognize that there can be a considerable time lag between poor adherence and treatment failure. Even in patients maintaining viral suppression, clinicians should reinforce the need for continued adherence.

- Incorporating a refill-based measure of adherence into clinical practice may allow real-time monitoring of adherence and an opportunity for intervention. Consideration should be given to automating this measure and providing it to clinical care teams as an early warning system. This strategy is ripe for testing in a clinical trial.

- Questions about financial worries may be useful as a way to identify patients at higher risk for adherence problems. If further research confirms these findings, financial worries should be addressed in behavioral interventions designed to improve retroviral adherence.

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