

Human Immunodeficiency Virus Infection Prevention: Strategies for Clinicians

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The complexity of the epidemic of human immunodeficiency virus (HIV) infection has made the creation of effective prevention programs an evolving and challenging task. Prevention of new HIV infections is an issue of increasing importance as the prevalence of HIV infection continues to increase. The integration of prevention and clinical care is recognized as a key element of future prevention activities. Prevention of HIV infection should extend beyond the traditional public health model to the clinical care site. The clinical care setting offers a unique opportunity to bring people with HIV disease into care and to establish relationships, thus creating a foundation for prevention-related activities. However, the expertise and energy that clinicians currently dedicate to diagnosis and treatment far exceeds that directed toward prevention. We review details about and the efficacies of specific prevention efforts of relevance in clinical practice, and we conclude with practical recommendations regarding the most simple and efficient ways of integrating both behavioral counseling and medical interventions as prevention tools into clinical practice.

Reports from the 14th International AIDS Conference (Barcelona, Spain) project that, in the absence of an expanded prevention effort, there will be 45 million new HIV infections by 2010. It is estimated that 29 million of these infections could be prevented with the expansion of existing prevention strategies. The success of prevention programs in both developing (e.g., Senegal, Thailand, and Uganda) and developed (e.g., United States) countries indicates that prevention does work. Although the bulk of our experience has involved the HIV-seronegative population, more recent strategies have shifted focus to the HIV-seropositive population [1, 2]. Of particular concern (and our focus here) is the population of HIV-seropositive patients in the clinical care setting. It is these patients who may be receiving antiretroviral therapy (ART) and exhibiting high-risk behaviors and thus have the potential to transmit both drug-susceptible and drug-resistant virus. This review will summarize the experience, to date, on HIV prevention in the

clinical care setting and on how we can use this experience to best incorporate prevention into our practice (table 1).

RISK BEHAVIORS

Although millions of people are at behavioral risk for HIV disease, transmission can occur only through people who are currently infected with HIV. A substantial minority of people living with HIV infection continue to engage in both high-risk sexual and high-risk drug use behaviors. Although the numbers vary greatly among different populations, continued risky behaviors have been documented among all subgroups of HIV-infected individuals: injection drug users (IDUs), heterosexual men and women, and men who have sex with men (MSM) [3–5]. Although much of the previous research on risk behavior has focused on sexual risk behaviors among MSM [6, 7], risky behavior affects all HIV-infected patient groups, including IDUs and heterosexual men and women [8].

Previous studies involving MSM have found that risk behaviors may increase if patients receiving ART have subjectively improved feelings of well-being or believe that an undetectable virus load indicates that it is safe to engage in high-risk behavior [9–13]. Trends in risk behavior and their relationship to receipt of ART may differ in HIV-positive IDUs or heterosexuals, who may have different cultural backgrounds and varied levels of

Received 26 September 2002; accepted 22 January 2003; electronically published 14 April 2003.

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Clinical Infectious Diseases 2003;36:1171–6

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1058-4838/2003/3609-0013\$15.00

Table 1. Strategies for clinicians.

Behavioral counseling interventions, with the following parameters
Supportive and nonpunitive counseling in a comfortable setting
Interactive counseling and motivational interviewing
Individualized counseling
Scripting of conversations
Goal-directed counseling with reasonable, attainable goals
Repeated sessions and incorporation into every clinical encounter
Medical interventions
Antiretroviral therapy
Reduction to and maintenance of undetectable virus load
Drug resistance monitoring
Promotion of adherence to therapy
Postexposure prophylaxis
Screening, diagnosis, and treatment of sexually transmitted diseases
Public health interventions
Promotion and distribution of condoms and clean needles
Use of HIV infection prevention posters, fact sheets, and brochures
Partner counseling and notification
Referral services
Substance abuse treatment
Psychiatric treatment

education and, thus, potentially different perceptions of how ART may impact the risk of transmitting HIV.

TRANSMISSION OF DRUG-RESISTANT HIV

Transmission of drug-resistant HIV has been well documented among all patient groups, including MSM, IDUs, heterosexuals, infants, and health care workers [14–18]. A recent report by Little et al. [19] documented a marked increase in the prevalence of primary genotypic (23%) and phenotypic (12.4%) drug resistance among 377 patients who had seroconversion in the 12 months before the study, when compared with the prevalence in 1995. Data regarding the prevalence of drug resistance among patients with chronic HIV infection in the era of HAART was recently reported [20, 21]. The largest study indicated a 78% prevalence of drug resistance among patients who were receiving HAART. This is of particular concern with regard to the prevention of HIV infection, because it is this group of patients that are capable of transmitting drug-resistant virus to uninfected persons [22].

PREVENTION IN THE CLINICAL CARE SETTING

Behavioral Counseling

Past experience. There is substantial evidence that behavioral counseling works as a prevention strategy [23–25]. The Na-

tional Institute of Mental Health (NIMH) Multisite HIV Prevention Trial [26] assessed the efficacy of a motivational behavioral intervention to reduce sexual risk behaviors for HIV infection among high-risk, heterosexual, low-income patients at 37 clinics across the United States. Patients in the intervention group who underwent a 7-session HIV infection risk-reduction program over the course of 1 year subsequently reported fewer unprotected sexual acts, had higher levels of condom use, and were more likely to use condoms consistently during a 12-month follow-up period. Other studies that used a 5-session intervention delivered by community-based paraprofessionals or mental health counselors [23] and an 8-week course of sex-specific counseling sessions [24] have shown significant benefit in reducing risk behaviors for HIV transmission.

Although previous studies had shown the efficacy of counseling on the initiation of behavior changes, Kamb et al. [27] conducted the first large, randomized, controlled trial (Project Respect) to evaluate the effect of counseling in reducing sexually transmitted diseases (STDs) among HIV-negative heterosexual patients at an STD clinic. The results showed that subjects in the 2 counseling arms were significantly more likely than those in the education-only arm to use condoms 100% of the time at 3 months of follow-up and were 30% less likely to have an incident STD (on the basis of laboratory diagnosis) at 6 months of follow-up.

In summary, previous studies indicate that behavioral counseling can indeed reduce sexual risk behaviors. However, the majority of these studies have used risk reduction counseling by specialized and trained research staff and not the usual clinical providers. It is imperative to broaden and generalize these experiences by devising prevention instruments and techniques for clinicians to use in the usual clinical care setting.

Barriers. Although clinicians believe that health promotion and disease prevention are part of the job, they currently engage in very little risk reduction intervention activity [28]. Barriers to clinician-delivered interventions are varied and include lack of training about and knowledge of sex- and drug-related behaviors, lack of discussion skills and reluctance to discuss issues of sex and drug use, belief that their attempts will not be successful, absence of perception that their patients are at risk, lack of standardized tools to assess patient risk, and, finally, constraints of time and resources. Clinicians may find it uncomfortable to discuss such issues as sex and prevention of infection, or they may believe that their patients are uncomfortable discussing these issues. Others may be busy discussing issues of adherence, toxicities, laboratory monitoring, and health maintenance and feel that there may not be sufficient time to address the issue of prevention. Still others may unrealistically perceive the goal of prevention activities to be the elimination of all high-risk behaviors, with an expectation of complete abstinence or sobriety rather than the aim of attain-

able and stepwise risk reduction; thus, they believe that their efforts will be fruitless.

Research, however, indicates that patients view clinicians as a trusted source of prevention information [29], and data on interventions for other behavioral issues show that a clinician's prevention messages can be effective. Success in changing patient behavior has been documented in many instances, including exercise promotion [30], smoking cessation [31], coronary risk reduction [32], breast self-examination [33], and adherence to STD treatment [34]. In addition, a wide variety of prevention programs have shown success in changing clinicians' behavior with their patients. The techniques described below can be used to overcome the aforementioned barriers and ideally can lead to positive changes in both patient and clinician behaviors.

Recommendations to clinicians. HIV disease is a chronic illness requiring multiple clinical encounters and a close patient-provider relationship. Furthermore, the clinic may be the only place where HIV-infected patients will have contact with someone who can inform and educate them about prevention of HIV transmission. The skills of clinicians and the relationships that they develop over time with patients can be favorably used as a key to a prevention strategy. Our personal experience with the NIMH-funded Options Project [35, 36] is an example of how prevention can be integrated into the clinical care setting. The Options Project involves clinicians' use of motivational interviewing techniques [37] at each clinical encounter to promote HIV risk reduction behavior change. The motivational interviewing strategies used include assessing the patients' HIV transmission risk behaviors and asking the patients to rate, on 10-point scales, how important it would be for them to reduce their risk behavior (or to maintain their pattern of safer behavior) and how confident they are that they could reduce their risk behavior or maintain safer practices. The patient and clinician then together devise prevention strategies to improve these scores. This encounter is repeated at every clinic session, and it is always tailored to the patient's ongoing transmission risk behaviors. Preliminary evidence suggests that the Options Project intervention may be effective in reducing risk behaviors for HIV transmission among HIV-infected patients receiving clinical care and that the intervention appears to have a significant impact on assisting individuals to maintain no risk [36]. We thus recommend behavioral counseling as a prevention tool in the clinical care setting, with the parameters that follow.

1. *Supportive and nonpunitive counseling in a comfortable setting.* Surveys indicate that patients do want to discuss such issues as sex and HIV prevention with their clinician and that they actually expect these discussions to take place. Creating a comfortable, nonjudgmental atmosphere in which the patient can discuss these issues is critical for the clinician and patient

to gain insight and to learn the best strategies for HIV prevention for each particular patient.

2. *Interactive counseling or motivational interviewing.* The content and duration of counseling necessary to achieve meaningful change in risk behaviors is an evolving issue. Strategies focusing on behavioral change have evolved over time as various tactics, which vary from a didactic educational approach to the more recent interactive counseling approach, have been used. The technique of motivational interviewing can help the patient discuss behavior and be involved in the decision-making process. It encourages patients to describe their behaviors and develop their own solutions. It can open up the door to productive discussions and use the patients' own strengths and views as tools to help them arrange safer behavior.

3. *Individualized counseling.* Given the variability of patients and settings, it is difficult to design a single effective intervention to be used in the clinical care setting. Recognizing the specific needs for each patient is critical in terms of formulating a plan for prevention. Although some patients may not be engaging in any high-risk behaviors, this may change over time, and it must be assessed at each visit. Each clinician must take into account what he or she knows about an individual patient, both from a behavioral and a biological standpoint. The technique of motivational interviewing is useful in that it can be applied and tailored to meet the needs of any particular patient.

4. *Scripting of conversations.* Initiating and incorporating discussions of sexual and drug use behavior is often difficult for clinicians. However, there are techniques that can be used to overcome this barrier. One used in the Options Project is the use of scripted phrases. Some clinicians find it helpful to have a scripted conversation to initiate discussion. This can help both by serving as a reminder to the clinician and by providing a way for the clinician to feel more comfortable introducing these issues. Furthermore, it can help provide the most sensitive way to deliver messages.

5. *Goal-directed counseling.* It is important that patients have a concrete sense of what they can do at the individual level to prevent the spread of HIV disease. Together with clinicians, patients can come up with goals that would specifically apply to their own risk of transmitting HIV. For example, a patient may agree to use condoms consistently or agree to always inform partners of his or her serostatus. In addition to the traditional therapeutic prescription that usually closes each clinical encounter, a tactic used in the Options Project is to hand each patient a "prevention prescription" with his or her individual goal for prevention of the spread of HIV infection.

6. *Repeated sessions.* Studies have shown that, although prevention messages may be part of initial encounters, they are much less frequently incorporated into subsequent visits. However, prevention messages need to be repeatedly delivered to

be effective. In addition, patients' behaviors change over time as their disease courses and social situations vary, which further emphasizes the importance of tailoring prevention messages to a particular point in time. There is no urgency to prevention messages; more importantly, there is a need to repeatedly deliver these messages as a routine part of every clinical encounter.

For example, a patient may be asked, "Now that we've finished discussing your medications, I'd like to ask you some questions about your sex and drug use behaviors. What behaviors are you involved in now? Would you feel comfortable discussing them? Can you think of anything that you might like to change about these behaviors, and what interest might you have for changing them? How might you be able to reduce the riskiness of your sex and drug use behaviors?" Or the patient may be asked, "How important is reducing risk behavior to you (on a scale of 1 to 10), and how confident are you that you can do this (on a scale of 1 to 10)?" These are general questions that allow clinicians to draw patients out and encourage them to lead the discussion. They are the most knowledgeable about the details of their behavior, and, with help to think it through, they will often come up with their own solutions.

Medical Interventions

In addition to behavioral counseling, traditional medical interventions including administration of HAART, administration of postexposure prophylaxis (PEP), promotion of adherence to therapy, and diagnosis and treatment of STDs are essential parts of a clinician's prevention armamentarium.

ART and PEP. ART has the potential to reduce virus load, infectiousness, and the likelihood of HIV transmission [38], thus theoretically functioning both as a treatment modality and as a preventive tool. The impact that ART can have on reducing the risk of HIV transmission has been demonstrated in the prevention of mother-to-child transmission of HIV [39, 40]. It follows from this experience that ART could also be of potential benefit in reducing the likelihood of HIV transmission by sexual and bloodborne transmission. Although US Centers for Disease Control and Prevention policy advocates the use of ART for PEP after occupational exposure to HIV [41], the primary evidence for the effectiveness of PEP in preventing sexual transmission of HIV derives from animal studies and extrapolation of data on occupational exposure [42], and the strategy has not yet been proven to be effective. ART and PEP are currently areas of great interest and potential benefit with regard to prevention of HIV transmission; however, both await further study before their utility as preventive measures can be established.

Adherence to therapy. Adherence is a complex clinical behavior with a wide array of determinants [43]. Adherence to HAART has increasingly been recognized as a major factor influencing biological and therapeutic outcome [44–46], as well

as a powerful independent predictor of virologic suppression [47]. Lapses in adherence can lead to an increase in virus load and subsequent selection and transmission of drug-resistant strains of HIV to sex and drug-use partners.

Wilson et al. [48] examined adherence to ART and its association with risk behaviors among 766 women, and they found that lower rates of adherence were associated with younger age, active drug use, detectable virus load, and lower quality of life. Most notable was the association found between lower adherence rates and an increased risk of inconsistent condom use among sexually active women. Thus, adherence to ART is of particular concern when considered in conjunction with unprotected sexual behavior. Clinician-supported interventions to maintain and improve high levels of adherence to therapy must be an integral part of both patient care and HIV prevention.

Screening, diagnosis, and treatment of STDs. The population of patients at risk for HIV infection is also at risk for other STDs. Ulcerative and nonulcerative STDs may actually promote HIV transmission by increasing susceptibility to HIV infection in the seronegative population and by augmenting HIV infectiousness in the seropositive population. It is estimated that individuals who are infected with STDs are at least 2–5 times more likely than uninfected individuals to acquire HIV infection if they are exposed to the virus via sexual contact [49]. STDs that cause genital ulcers (e.g., syphilis, herpes, and chancroid) create breaks in the genital tract lining or skin, creating a portal of entry for HIV. Nonulcerative STDs (e.g., chlamydia, gonorrhea, and trichomoniasis) may also increase susceptibility by increasing the concentration of cells in genital secretions that can serve as targets for HIV (i.e., macrophages and CD4 cells). In addition, HIV-infected individuals who are coinfecting with other STDs are more likely to have higher virus titers in their genital secretions, contributing further to a greater risk of transmitting HIV infection to their sex partners.

In terms of prevention of HIV infection, it has been shown at both the individual level and community level that treatment of STDs can lead to a decrease in the rates of HIV transmission. At the individual level, studies have shown that treatment of STDs in HIV-infected individuals decreases both the amount and frequency of HIV shedding. Thus, clinicians may have an important opportunity to reduce HIV transmission among their patients by aggressive and systematic screening and treatment of coexisting STDs. At the community level, there is evidence to support this as well. The Mwanza [50] and Rakai [51] studies from Africa evaluated the impact that treatment of STDs would have on the incidence of HIV transmission. The results of these 2 trials indicate that ongoing interventions to improve access to effective STD treatment services among symptomatic individuals reduces HIV transmission and is likely to be more effective than are intermittent interventions through such strategies as periodic mass treatment.

Public Health Initiative

Collaboration with existing public health efforts remains a critical aspect for clinicians in the multifactorial approach to prevention of HIV infection. These efforts include distribution of condoms and clean needles; use of HIV prevention posters, fact sheets, and brochures, which can be distributed in the clinics; programs to assist patients with partner counseling and notification; and referral services beyond the scope of the clinical setting for treatment of substance abuse, psychiatric treatment, and other risk behavior services.

CONCLUSIONS

The clinical care setting is an ideal place for the implementation of prevention practices, given the chronic nature of HIV disease, its requirement for multiple clinic visits over time, and the resultant close patient-provider relationship. Both behavioral and traditional medical interventions should become more formalized and incorporated into our clinical practice in a simple and efficient manner. Behavioral counseling that is supportive, interactive, directed toward a goal, and individualized should be administered at every clinical encounter, with scripted phrases used as needed. HAART and PEP should be administered as recommended by current guidelines, with the goal of both treatment of HIV disease as well as potential prevention of further spread of the disease to uninfected persons.

Promotion of adherence, risk reduction counseling, STD screening, diagnosis, and treatment should all be routine and integral components of patient care and, thus, clinicians' prevention practice. The addition of behavioral counseling and medical HIV transmission prevention interventions in the clinical care setting to the current public health prevention effort is the next logical step in our prevention efforts and our attempts to curb the HIV epidemic.

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