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## High Rates of Sexually Transmitted Infections in HIV-Infected Patients Attending an STI Clinic

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### Abstract

**Objectives**—To evaluate the rates and types of sexually transmitted infections (STIs) in patients infected with the human immunodeficiency virus (HIV) attending a public STI clinic in Miami, Florida as compared with HIV-uninfected patients attending the same clinic.

**Methods**—This was a retrospective review of medical records of individuals attending the Miami-Dade County Health Department STI clinic from March 2012 to May 2012. Demographic and clinical information was abstracted and transferred to an electronic database. Consecutive age-matched HIV-infected and HIV-uninfected patients were identified during the study period. Demographics, risk factors, and history and rates of STIs for HIV-infected and HIV-uninfected patients and for those with newly diagnosed and previously diagnosed HIV infection were compared.

**Results**—A total of 175 medical records were reviewed (89 HIV-infected patients and 86 HIV-uninfected patients). The median age was 37 years. A history of STIs, including syphilis, was more common in HIV-infected than in HIV-uninfected patients. Individuals with a prior diagnosis of HIV were more likely to be older (older than 37 years of age,  $\chi^2=15.3$ ,  $P < 0.01$ ), male ( $\chi^2=4.74$ ,  $P = 0.05$ ), to have a new STI ( $\chi^2=5.83$ ,  $P = 0.01$ ), to have a new diagnosis of syphilis ( $\chi^2=5.15$ ,  $P = 0.01$ ), and to be under medical care ( $\chi^2=31.19$ ,  $P < 0.001$ ) than those newly diagnosed as having HIV.

**Conclusions**—HIV-infected individuals who attended this urban STI clinic had high rates of new and past STIs, suggesting the persistence of high-risk sexual behaviors. STI clinics could be a premier site to identify individuals with HIV and high-risk sexual behaviors who could benefit from additional targeted interventions.

### Keywords

human immunodeficiency virus; sexually transmitted infection; prevention

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Sexually transmitted infections (STIs) in individuals infected with the human immunodeficiency virus (HIV) have been shown to increase mucosal HIV shedding and HIV transmission and to facilitate the spread of both STIs and HIV infections.<sup>1</sup> In addition,

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STIs in HIV-infected people may serve as a surrogate for persistent high-risk sexual behaviors.<sup>2,3</sup>

Guidelines recommend screening for HIV infection when a diagnosis of an STI is made and regular STI screening for individuals infected with HIV.<sup>4</sup> Despite these recommendations, significant increases in STIs among individuals with HIV infection have been described, in particular among men who have sex with men.<sup>3,5,6</sup> New cases of syphilis among HIV-infected men who have sex with men are increasing, and in many cases both syphilis and HIV are newly diagnosed at the same time.<sup>7,8</sup> The United States has one of the highest rates of STIs in the general population among industrialized countries.<sup>9</sup> In the United States, STI clinics are accessed frequently by HIV-infected individuals for sexual health<sup>10</sup> and are the sites where routine STI testing, diagnosis, and treatment are most frequently provided.

Miami has been an epicenter of HIV in the United States since the beginning of the epidemic. With an acquired immunodeficiency syndrome incidence rate of 27.4 cases per 100,000 population, it remains the metropolitan area with the highest rate of HIV infection in the country.<sup>11,12</sup> Miami also is a city with high rates of STIs<sup>13</sup>; for example in 2012, Miami-Dade was the county with the seventh highest number of cases of primary and secondary syphilis in the United States.<sup>13</sup> The Miami-Dade County Health Department STD Clinic (MDCHD STD) is centrally located in the city and provides STI and HIV screening and STI treatment to anyone who requests STI-related services. This clinic does not, however, provide continuity of care to HIV-infected patients.

The objective of this study was to evaluate the rates and types of STIs in HIV-infected patients attending the MDCHD STD clinic. We hypothesized that rates of STIs are higher in individuals with HIV infection compared with HIV-uninfected individuals and that among individuals with HIV infection, those newly diagnosed as having HIV have higher rates of STIs than those with a prior HIV diagnosis.

## Methods

### Study Design

A convenience sample of medical records from individuals who requested services at the MDCHD STD clinic from March 2012 to May 2012 was selected and a retrospective review of the medical records of all individuals with HIV infection was performed. Age-matched, HIV-negative controls consecutively seen in the same clinic during this period were identified and their records also were reviewed. Demographics, risk factors, HIV-related history, and STI and HIV testing results were extracted from the medical records and transferred to an electronic database.

### Study Site and Participants

The study was performed at the MDCHD STD clinic. This clinic is centrally located in the city of Miami and serves primarily a low-income, urban, nonwhite population with high rates of STIs and HIV. At this STI clinic, all of the clients undergo a clinical interview; medical examination; and testing for HIV, syphilis, chlamydia, and gonorrhea. The clinical history includes routine screening questions from a standard Department of Health (DOH)

form. The questions include risk factors for STI: sexual partner type (sex with men, women, or both), number of partners in the previous 2 months and in the previous year, use of condoms in the last sexual encounter, and history of STI and HIV. Clients who report having a diagnosis of HIV infection are asked by providers about engagement in care and use of antiretrovirals. Those without a prior HIV diagnosis are asked whether they received routine medical care. HIV testing is offered as part of the STI routine visit for all clients without a prior positive test. HIV testing is performed using a rapid test in blood (Clearview HIV 1/2, Alere Inc, Waltham, MA), and positive tests are confirmed with Western Blot at the Florida DOH laboratories. For the purpose of this study, patients with a known HIV diagnosis were defined as those who had a documented diagnosis of HIV in the DOH surveillance records or presented documentation of prior HIV infection at the time of the clinic visit. Patients with a new HIV diagnosis were defined as those who tested positive for HIV, were not aware of the HIV infection, and did not have a previously documented diagnosis of HIV in DOH surveillance records.

Testing for chlamydia and gonorrhea was performed using APTIMA Combo 2 Assay (Hologic Inc, Marlborough, MA) in urine, cervical, or rectal specimens. Rectal testing was offered to both men and women who reported receptive anal intercourse. Syphilis testing included rapid plasma reagin and syphilis enzyme immunoassay immunoglobulin G or fluorescent treponemal antibody absorbed if the rapid plasma reagin was reactive. Dark field examination was performed for any genital lesion. Infectious syphilis was defined by Centers for Disease Control and Prevention criteria and included primary, secondary, early latent syphilis, and late latent syphilis of unknown duration.<sup>3</sup>

Before any study-related interventions, institutional review board approvals were obtained from the University of Miami Miller School of Medicine and the Florida DOH. Because of the retrospective nature of this study, a waiver of informed consent was granted by both regulatory agencies.

### Statistical Analysis

SPSS version 21 (IBM SPSS Statistics, Armonk, NY) was used for analysis. Demographic, sexual risk factors, and medical history including STIs and engagement in care were presented descriptively. A  $\chi^2$  test of independence was used to test the frequency of STI occurrence in individuals with prior HIV infection compared with those with new HIV infection. The Fisher exact test was used when the expected value within any of the cells of the contingency tables was  $<5$ .  $P < 0.05$  was considered significant.

### Results

A total of 175 charts were reviewed (89 HIV-infected patients and 86 HIV-uninfected patients). The median age was 37 years. Most participants were men (131, 75%) and engaged in sex with other men (75, 57%). More than half of the clients had a history of an STI (109, 62%) and half had a current STI (chlamydia, gonorrhea, or infectious syphilis: 88, 50%).

### Demographics and STI in HIV-Positive Patients Versus HIV-Negative Patients

HIV-infected and -uninfected individuals were matched by age. HIV-positive individuals were more likely to be men (92.1% vs 56.9%,  $\chi^2 = 8.84$ ,  $P < 0.05$ ) and engage in sex with other men (69.6% vs 15.1%,  $\chi^2 = 2.62$ ,  $P < 0.05$ ). The frequency of prior STIs (85.0% vs 38.3%,  $\chi^2 = 17.43$ ,  $P < 0.05$ ) and infectious syphilis (20.2% vs 10.1%,  $\chi^2 = 3.46$ ,  $P < 0.05$ ) was higher among HIV-infected individuals when compared with HIV-uninfected controls. There was no difference between HIV-positive and HIV-negative patients in rates of current infections with gonorrhea or chlamydia.

### Demographics, Risk Factors, and STIs of Individuals Newly Diagnosed as Having HIV Versus Individuals with Prior HIV Diagnosis

Among the 89 patients with HIV infection, 68 (76%) had a diagnosis of HIV before their STI clinic visit and 21 (24%) were diagnosed as having HIV at the time of the clinic visit (new HIV). For HIV-infected individuals, the median age was 37 years. The majority was men (82, 92%) and engaged in sex with other men (68, 76%). The number of sex partners was high (median number of sex partners in the previous 2 months was 2 and in the previous year was 6), and condom use was low (<50% reported condom use during the most recent sexual encounter).

Individuals with a prior HIV diagnosis were more likely to be older than 37 years of age ( $\chi^2 = 15.3$ ,  $P < 0.01$ ), male ( $\chi^2 = 4.74$ ,  $P = 0.05$ ), have a prior diagnosis of an STI (chlamydia, gonorrhea, or infectious syphilis;  $\chi^2 = 5.83$ ,  $P = 0.01$ ), have a new diagnosis of infectious syphilis ( $\chi^2 = 5.15$ ,  $P = 0.01$ ), and presently receive medical care ( $\chi^2 = 31.19$ ,  $P < 0.001$ ).

There was no difference between the two groups regarding sexual partner preference, number of partners in the last 2 months or in the last year, condom use during the last sexual encounter, history of prior STIs, or current diagnosis of chlamydia or gonorrhea (Table).

## Discussion

We evaluated rates of STIs in individuals with HIV infection attending the MDCHD STD clinic. We found high rates of STIs among people infected with HIV. Surprisingly, despite reporting similar sexual risk factors (number of partners, condom use, and history of STI), HIV-infected patients were more likely to have an STI than the HIV-negative, age-matched controls. Also, individuals with prior HIV infection had higher rates of STIs than those who were newly diagnosed as having HIV. Among individuals with an HIV diagnosis, more than half had a new STI at the time of the visit to the STI clinic, and the rates of a new STI in patients with HIV infection were higher than in those without HIV infection. This difference was driven mainly by syphilis (35% of individuals with prior HIV infection had infectious syphilis versus 9% of individuals with newly diagnosed HIV).

Increases in STIs among individuals with HIV infection have been reported in the literature from STI clinic settings in the United States.<sup>3,5,6</sup> Erbeding et al evaluated STI incidence in individuals with a new HIV diagnosis and found rates of up to 7 cases per 100 individuals per year<sup>3</sup>; Taylor et al and Scott et al found high rates of chlamydia or gonorrhea and HIV co-infection in STI clinics in the United States.<sup>5,6</sup>

Our findings are consistent with those reported in the literature. In addition, we evaluated STI frequencies by new or known HIV diagnosis. We found that a group of previously diagnosed HIV-positive patients seen at the MDCHD STD clinic continue to engage in high-risk sexual activity that is likely to transmit both STIs and HIV. Some individuals in this community may not be engaged in high-risk behaviors, but it has been shown that as the prevalence of STIs increases in a community, the individual-level risk factors becomes less important than population factors for STD risk.<sup>14</sup>

The contribution of this group to the ongoing HIV epidemic in Miami is unclear; however, it certainly deserves additional research because this city remains one of the large metropolitan areas with the highest rates of HIV infection in the country. In addition, it raises the concern that STI prevention campaigns may not be reaching the HIV-infected population who may be engaged in HIV care but is not having routine STI testing performed.

As expected, we found that patients with established infection were more likely to report receiving medical care compared with patients newly diagnosed as having HIV. It is concerning, however, that approximately 18% of the patients known to be infected with HIV were not receiving medical care. This is certainly an additional factor that contributes to the ongoing epidemic in Miami and possibly in other cities with high rates of HIV infection.

This study has several limitations. It is possible that some HIV-positive patients were misclassified because not all patients who attend this clinic undergo an HIV test (although most do—approximately 85%–90%). Some patients do not disclose their HIV status and refuse HIV testing. All information regarding sexual risk factors, engagement in care, receipt of treatment for HIV, and history of STIs was self-reported, and therefore was subject to reporting and recollection bias. There was no access to CD<sub>4</sub> T-cell counts or HIV viral loads. We did not collect socioeconomic information that would have allowed additional characterization of risk factors for STI acquisition.

Despite these limitations, we believe the information obtained by this study is of significant value. We highlight the existence of a group of individuals with known HIV infection and increased risk of transmitting HIV infection and other STIs. This group is characterized by the acquisition of new STIs after the diagnosis of HIV and incomplete engagement in HIV care. These data also suggest that clinics such as this could be a premier setting for providing counseling and testing interventions to decrease risky sexual behaviors and STIs in the HIV-infected population, as well as facilitating linkage to HIV care. STI prevention campaigns including an HIV prevention component may not reach individuals who are already infected with HIV and at risk of transmitting HIV to their sexual partners. Despite high rates of STIs and HIV in STI clinics and public health interventions to decrease STIs, a large randomized controlled trial of intensive risk-reduction counseling for STI clinic attendees, reductions in rates of STIs were not observed.<sup>15</sup> Although we believe STI prevention campaigns should engage all individuals attending STI clinics, programs targeting individuals with HIV infection and ongoing STIs may be indicated to address the needs of this group that has a high risk for transmission of both HIV and STIs to partners.

## Conclusions

HIV-positive individuals who attended this urban STI clinic had high rates of past and new STIs, suggesting persistent high-risk behaviors leading to an increased risk of HIV transmission in the community. STI clinics could be a premier site for identifying HIV-positive individuals exhibiting high-risk behaviors in need of additional targeted interventions.

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**Key Points**

- It is important to perform screening for sexually transmitted infections (STIs) in individuals infected with the human immunodeficiency virus (HIV).
- High rates of STIs can be seen in HIV-infected individuals who attend STI clinics.
- STI clinics can be premier sites to identify HIV-infected individuals with high-risk sexual behaviors who are not receiving medical care.



**Table**

Demographics, risk factors, and STIs in individuals with known and newly diagnosed HIV infection

Demographics and risk factors	Total	N= 89, %	Known HIV, N =68	76%	New HIV N=21	24%	$\chi^2$	P
Age, y (mean 37, SD 12)								
Younger than 37	43	48	25	37%	18	86%	15.3	<0.001
Older than 37	46	52	43	63%	3	14%		
Sex								
Male	82	92	65	96%	17	80%	4.74	0.05
Female	7	8	3	4%	4	20%		
Sexual modalities								
Same sex	68	76	55	80%	13	62%	3.2	0.07
Opposite sex	21	24	13	20%	8	28%		
No. partners in prior 2 mo (mean 2.3, SD 5.9)								
<2	15	17	56	82%	18	86%	0.22	0.42
>2	74	83	12	28%	3	14%		
No. partners in prior year (mean 6.2, SD 12.8)								
<6	18	20	13	19%	5	24%	0.21	0.42
>6	71	80	55	81%	16	76%		
Condom use in last sex act	42	47	49	55%	7	35%	2.5	0.09
STIs								
History, excluding HIV	67	75	55	81%	13	62%	3.57	0.06
STI-related symptoms	16	18	11	16%	5	23%	0.22	0.42
Current STI	50	56	42	63%	7	33%	5.83	0.01
Current infection, chlamydia	10	11	7	10%	3	14%	0.25	0.43
Current infection, gonorrhoea	9	10	8	12%	1	5%	0.86	0.35
Current infection, infectious syphilis	26	29	24	35%	2	9%	5.15	0.01
Currently in medical care	58	31	56	82%	3	14%	31.19	<0.001

Bold type indicates statistical significance. HIV, human immunodeficiency virus; SD, standard deviation; STI, sexually transmitted infection.