

## ABSTRACT

**Objectives.** We evaluated the prevalence of gonorrhea, chlamydia, trichomoniasis, and syphilis in patients entering residential drug treatment.

**Methods.** Data on sexual and substance abuse histories were collected. Participants provided specimens for chlamydia and gonorrhea ligase chain reaction testing, *Trichomonas vaginalis* culture, and syphilis serologic testing.

**Results.** Of 311 patients, crack cocaine use was reported by 67% and multisubstance use was reported by 71%. Sexually transmitted disease (STD) risk behaviors were common. The prevalence of infection was as follows: *Chlamydia trachomatis*, 2.3%; *Neisseria gonorrhoeae*, 1.6%; trichomoniasis, 43%; and syphilis, 6%.

**Conclusions.** STD counseling and screening may be a useful adjunct to inpatient drug treatment. (*Am J Public Health*. 2000;90:1615–1618)

# Risk and Prevalence of Treatable Sexually Transmitted Diseases at a Birmingham Substance Abuse Treatment Facility

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Newer diagnostic test methods such as nucleic acid amplification tests for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* and pouch culture systems for *Trichomonas vaginalis* allow simplified specimen collection, permitting the use of voided urine or, for women, patient-obtained vaginal swabs for diagnostic testing. In turn, these simplified specimen collection procedures now permit highly sensitive<sup>1–4</sup> testing for treatable sexually transmitted diseases (STDs) in nonclinical sites and at other locations of convenience where at-risk persons might congregate.<sup>5–8</sup>

A growing literature supports the association between drugs (including alcohol) and high-risk sexual behavior.<sup>9–12</sup> Most of these studies, however, focused on persons who were actively using drugs. In contrast, there are few data on drug and alcohol users who enter treatment, despite opportunities for more ready access to, and follow-up of, this group. Residential treatment centers might be desirable sites for STD screening and risk reduction interventions. The goals of this study were to describe STD risk behaviors and STD prevalence among men and women voluntarily seeking inpatient drug treatment and detoxification.

## Methods

### Population

From January to July 1999, all clients admitted as inpatients to a Birmingham, Ala, substance abuse treatment facility were asked within 3 days of admission to participate in the study. After giving written informed consent, participants answered questions regarding demographic information, genital symptoms (discharge, dysuria, abnormal odor or itching), health-seeking and sexual risk behaviors, and substance abuse history. Following the inter-

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view, men and women were asked to provide urine specimens for *C. trachomatis* and *N. gonorrhoeae* testing with ligase chain reaction (LCR) assays, which were processed according to the manufacturer's instructions (LCX STD Specimen Collection and Transport Kit, Abbott Laboratories, Abbott Park, Ill).<sup>1,2</sup> For vaginal Gram stain collection and *T. vaginalis* culture, women also were asked to successively insert 2 Dacron swabs a few inches ("like a tampon") into the vagina and rotate them several times.<sup>4,13,14</sup> The first swab was rolled across a glass slide that was stored for future Gram staining; the second was inoculated into In Pouch TV (Biomed, San Jose, Calif) Trichomonas culture medium.<sup>4</sup> *T. vaginalis* cultures were stored at room temperature until they reached the laboratory, within 12 hours of collection.

Results of routinely collected syphilis serologic tests were made available to the investigators; however, institutional confidentiality concerns made results of HIV tests unavailable on an individual basis. Group HIV data for all inpatients screened during the study period are presented. All patients were informed that if their gonorrhea or chlamydia tests were positive, the results would be reported to the Alabama Department of Health. This protocol was reviewed and approved by the Institutional Review Board for Human Use at the University of Alabama at Birmingham.

#### Laboratory Methods

Upon their receipt at the laboratory, *T. vaginalis* cultures were incubated at 35°C and read daily until the fifth day after inoculation. Cultures were considered positive if motile trichomonads were identified within the pouch.<sup>4</sup> Urine specimens for LCR were processed upon receipt in the laboratory. LCR assays for *C. trachomatis* and *N. gonorrhoeae* were performed according to the manufacturer's instructions.<sup>1,2,15</sup> Vaginal bacterial flora was assessed by Gram stain and graded by the Nugent criteria, an 11-point scale in which scores of 7 or above are defined as consistent with bacterial vaginosis.<sup>13,16</sup> Syphilis serologic testing was performed by the rapid plasma reagin test, with confirmation of positive results performed with *Treponema pallidum* hemagglutination.<sup>17</sup>

#### Treatment

Each client was informed of his or her laboratory test results. Patients with a score of 7 or above by the Nugent criteria were asked if they were experiencing genital discharge or odor. Asymptomatic patients were informed about bacterial vaginosis and offered treatment, although treatment was not required. Clients with a positive gonorrhea or chlamydia LCR test, positive trichomonas culture, or sympto-

**TABLE 1—Selected Demographic and Self-Reported Behavioral Characteristics of 311 Patients Entering Residential Drug Treatment: Birmingham, Ala, 1999**

|   | Study Population |                      |
|---|------------------|----------------------|
|   | Men<br>(n=208)   | Women<br>(n=103)     |
| Median age, y (range)                           | 37 (16–65)       | 35 (19–54)           |
| Ethnicity, n (%)                                |                  |                      |
| African American                                | 139 (67)         | 65 (63)              |
| White   | 66 (32)          | 36 (35)              |
| Other   | 3 (1)            | 2 (2)                |
| Median education, y (range)                     | 12 (5–16)        | 12 (5–16)            |
| Median no. of sex partners in last 6 mo (range) | 2 (0–40)         | 1 (0–35)             |
| New partner in last 30 days, n (%)              | 26 (13)          | 13 (13)              |
| Ever exchanged sex for drugs, n (%)             | 31 (15)          | 41 (40)              |
| Cannabis use, n (%)                             | 100 (48)         | 42 (41)              |
| Tobacco use, n (%)                              | 177 (85)         | 86 (84) <sup>a</sup> |
| Used intravenous drugs at least once, n (%)     | 50 (24)          | 29 (28)              |

<sup>a</sup>Information not available for 1 woman.

matic bacterial vaginosis were treated under physician supervision in accordance with the Centers for Disease Control and Prevention's STD treatment guidelines.<sup>18</sup> All positive gonorrhea and chlamydia test results were reported to the Alabama Department of Public Health. Partner notification and treatment were strongly encouraged.

#### Data Management and Analysis

Questionnaire data and laboratory results were entered into SPSS software.<sup>19</sup> We used EXACT software (EXACTv.2.06, 1988–1995; David Martin, MD, MPH) to calculate prevalence odds ratios, using conditional maximum likelihood estimates with mid-*P* exact 95% confidence intervals. Summary odds ratios were reported for data stratified by sex.

## Results

#### Study Population

Of 321 clients asked to participate, 311 (103 females [33%] and 208 males [67%]) agreed to enroll (Table 1). Sixty-six percent of participants were African American and 33% were White. The median age was 36 years (range=16–65 years). Twenty percent of women (21 of 103) and 23% of men (47 of 208) reported being married or living with a sex partner. Eighty-seven percent of females and 73% of men were unemployed at the time of entry into the facility. The most common reason for refusing to participate was a recent STD screening.

#### Recent Health-Seeking Behavior

Sixty percent of women and 47% of men stated that they had received medical or dental

care in the last year, mostly visits for routine (82%) or acute (47%) medical care. Fifty-three percent of women and 36% of men reported prior STDs, and 42% of the study population (50% of women and 37% of men) had visited an STD clinic in the past. Of patients who reported prior STD treatment, 80% stated that they were treated at a health department.

#### Sexual Behavior

Thirty-two patients (10%; 4 women [4%] and 28 men [13%]) stated that they had not been sexually active in the prior 6 months. Of sexually active participants, 143 (46%) reported multiple sexual partners during the 6 months before study enrollment. Thirty-eight percent (48% [48 of 99] of women and 32% [58 of 180] of men) acknowledged sex with at least 1 new partner in the past 6 months, and 13% (39 of 305) of both men and women acknowledged new partners during the 30 days preceding admission. Fifty-six percent of the study population (61% of women [63 of 103] and 58% of men [118 of 205]) reported that they did not use condoms during any of the last 10 episodes of sex, and 86% (264 of 308) of clients who answered the question stated that they were "high" during at least 1 of their last 10 sexual encounters. Forty percent of women [41 of 103] and 15% of men [31 of 208] reported that they had exchanged sex for drugs in the past.

#### Substance Use History

Sixty-four of 103 women (62%) and 124 of 208 men (60%) reported prior drug treatment. Sixty-seven percent of clients (75% [77 of 103] of women and 63% [132 of 208] of men) gave a history of cocaine use, and 76% (72% [74 of

**TABLE 2—Prevalence of Treatable Sexually Transmitted Diseases in Clients Entering a Substance Abuse Treatment Facility: Birmingham, Ala, 1999**

|   | No. of Men (%)<br>(n=208) | No. of Women (%)<br>(n=103) | Total<br>(n=311) |
|---|---------------------------|-----------------------------|------------------|
| <i>Neisseria gonorrhoeae</i>              | 4 (2)                     | 1 (1)                       | 5 (1.6)          |
| <i>Chlamydia trachomatis</i>              | 5 (2.4)                   | 2 (2)                       | 7 (2.3)          |
| <i>Trichomonas vaginalis</i> <sup>a</sup> | ...                       | 44 (43)                     | ...              |
| Syphilis <sup>b</sup>                     | 3 (1.5)                   | 1 (1)                       | 4 (1.3)          |

<sup>a</sup>Test results missing for 1 woman; men were not tested.

<sup>b</sup>Untreated syphilis; data available for 299 clients (98 women and 201 men).

103] of women and 78% [163 of 208] of men) used alcohol either alone or in combination with other drugs. Seventy-one percent (220 of 311) of clients acknowledged multisubstance abuse. Fifty-three percent of participants reported use of combinations of cocaine and alcohol, often with other substances. Twenty-eight percent of women and 24% of men had used intravenous drugs at least once.

### STD Prevalence

Of 311 clients screened, 58 (19%) had 1 or more treatable STDs (Table 2). Twelve (3.9%) had positive LCR test results for gonococcal or chlamydial infection. Seven patients (2 women and 5 men) had positive tests for *C. trachomatis* and 5 (1 woman and 4 men) had positive tests for *N. gonorrhoeae*. Four of 5 men with positive chlamydia test results, and 3 of 4 with positive gonorrhea test results, were asymptomatic. Gonorrhea rates did not vary with age, whereas 3.4% of patients younger than 30 had chlamydial infection compared with 1.8% of those older than 30. All clients with positive chlamydia or gonorrhea test results were treated.

Forty-four of 102 women (43%) tested for *T. vaginalis* had positive cultures; 61% of them denied having genital symptoms. Women who reported cocaine use were more likely to have trichomonas than those who did not (51% vs 20%; odds ratio [OR]=4.1; 95% confidence interval [CI]=1.4, 11.6;  $P < .05$ ). Thirty-nine of 44 women (89%) with trichomoniasis were treated before being discharged from the substance abuse treatment facility. The 5 women who were not treated left against medical advice before test results were known.

Sixty-two of 101 women (61%) with results available had a Nugent criteria Gram stain score of 7 or above, consistent with a diagnosis of bacterial vaginosis (35% of women had a score of 9 or above). Sixty-six percent of women (40 of 61 with available symptom histories) with vaginal Gram stain scores consistent with a diagnosis of bacterial vaginosis were asymptomatic. Thirty-four of 62 women (55%) with bacterial vaginosis were treated with 7-

day courses of metronidazole. Twenty-seven women (79%) treated for bacterial vaginosis had trichomoniasis as well. Women with bacterial vaginosis were slightly more likely to have trichomoniasis than were women without bacterial vaginosis (47% vs 37%), but this did not reach statistical significance (OR=1.5; 95% CI=0.7, 3.5;  $P > .05$ ).

Of 299 participants with rapid plasma reagin results available, 8% (8 of 98) of women and 6% (11 of 201) of men had reactive tests. Seventeen clients (90%) had positive confirmatory tests by *T. pallidum* hemagglutination, of whom 4 (24%) had never been diagnosed with syphilis before and probably represented new cases. Of the 4 newly diagnosed cases, 3 were classified by health department officials as early latent syphilis and 1 as late latent syphilis.

From January to June 1999, a total of 499 clients entering the facility were tested for HIV. Of these, 10 (2%) had positive test results, 4 (40%) of which represented new diagnoses.

### Discussion

In this study, despite the high prevalence of sexual risk behavior and trichomoniasis, the prevalence of gonococcal and chlamydial infections was relatively low. Most infections were asymptomatic, however, and, considering their relatively high rates of changing partners, these clients could disproportionately contribute to community STD morbidity.<sup>20</sup> In addition, 1% of clients also had previously untreated syphilis, and almost 1% presented with undiagnosed HIV, which might unknowingly be transmitted to others. Screening in substance abuse treatment facilities such as this one may reach asymptomatic clients who serve as reservoirs of infection.

In contrast to chlamydial and gonococcal infections, the prevalence of trichomoniasis was very high in this predominantly crack-abusing female population. Once again, in most of these cases the clients were asymptomatic. This finding is consistent with prior studies documenting associations between tricho-

moniasis and crack use.<sup>21,22</sup> Bacterial vaginosis is another highly prevalent and largely asymptomatic condition seen at this substance abuse treatment facility. Given recent descriptions of associations of these processes with serious complications and sequelae,<sup>23-25</sup> screening for these disorders, as well as for reportable STDs, may be warranted.

Screening in the setting of voluntary substance abuse treatment targets people who are ready to change their behavior. A study by Hoffman et al.<sup>26</sup> lends support to this hypothesis. They found that entry into treatment corresponded to reductions in the practice of risky sexual behaviors, although these reductions were less substantial and less consistent than those noted for drug use and injection risk behaviors. People in this situation may be more open to counseling about STDs and HIV.

In summary, treatable STDs were common in this initial study of persons entering drug treatment. As part of comprehensive efforts to treat persons who use drugs, diagnosis and therapy for other associated problems, including STDs, may be appropriate. □

### Contributors

L. H. Bachmann served as the principal investigator for the study. I. Lewis and R. Allen contributed significantly to the conception and design of the study, the recruitment and interviewing of the clients, and the revision of the content. J. R. Schwebke, E. W. Hook, L. C. Leviton, and H. A. Siegal contributed to the conceptualization and design of the project, and each took part in the revision of the paper. Dr. Hook was also involved in the interpretation of the data.

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