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Universal HIV Screening at a Major Metropolitan TB Clinic: HIV Prevalence and High-Risk Behaviors Among TB Patients

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ABSTRACT

Objectives. This study assessed the outcome of implementing a policy of universal screening of patients with tuberculosis (TB) for HIV infection at a major metropolitan public health TB clinic.

Methods. HIV serologic testing was completed on 768 (93%) of 825 eligible patients. Ninety-eight HIV-positive cases (13%) were compared with 670 HIV-negative cases. The presence of adult HIV risk factors was determined by structured interview and review of medical records.

Results. One or more HIV risk factors were present in 93% of HIV-positive cases and 42% of HIV-negative cases.

Conclusions. The metropolitan TB clinic is well suited for HIV screening, and HIV-antibody testing and counseling should be provided to all TB patients. (*Am J Public Health.* 1999;89:73–75)

The HIV epidemic has been proposed as the principal reason for the increased number of tuberculosis (TB) cases first observed in 1986. Immunosuppression resulting from HIV infection increases the frequency and rate of progression from TB infection to disease.[1,2] A blinded survey of specimens collected from routine clinical care in 14 cities found a median HIV coinfection rate of 3% (range, 0%–46%).[3] By contrast, studies from San Francisco, Miami, and New York have reported that 28% to 46% of adult patients with TB were HIV infected.[4–6] The association between HIV and TB resulted in the 1989 recommendation by the Advisory Council for the Elimination of Tuberculosis that all patients with TB be screened for HIV infection.[2]

Little published data are available on health provider response to the 1989 recommendation. One study from a Detroit medical center indicates that screening of patients without HIV risk factors increased from 17% to 30% and that 74% of patients with HIV risk factors were screened.[7] A similar study from Los Angeles reports that HIV screening was not performed for 43% of patients without HIV risk factors.[8] This would suggest that targeted screening based on assessment of HIV risk factors may be the norm. In this study, we report on the results of implementing a policy of universal screening of adult TB patients for HIV infection.

Methods

All adult patients (>17 years old) with a positive culture for *Mycobacterium tuberculosis* who were reported to the Tarrant County Health Department in Fort Worth, Tex, between December 1, 1987, and August 31, 1996, were eligible for inclusion. All patients were asked to participate in a structured interview. Only patients with a documented test for HIV infection as verified by the medical record were included in the study. Study participants were divided into 2 groups—HIV-positive and HIV-negative—according to HIV serologic test results.

The survey interview was administered by a single investigator (S.E.W.). The interview was designed to obtain demographic and life history data and to determine the presence of adult HIV risk factors. When face-to-face interviews were not possible, the data were obtained from medical records and family interviews. Unobtainable data were reported as unknown and were excluded from comparative analysis.

Demographic data included sex, age, race or ethnicity, and country of birth. Life history data included prior imprisonment, prior homelessness, history of alcoholism, and blood transfusions between 1978 and 1986. Adult HIV risk factors included intravenous (IV) drug use, the use of crack cocaine or other inhaled drugs, male homosexuality, multiple sexual partners, and having sexual relations with a person known to be HIV infected, a homosexual male, an IV drug user, or a prostitute. Sexual partner frequency was defined as the highest number of partners in any 1 year over the preceding 10 years and was reported as 2 or fewer and 3 or more. Persons were reported as having had sex with a prostitute if they admitted to having exchanged either money or drugs for sex.

Categorical data were compared for statistical significance by using a χ^2 contingency

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analysis or the Fisher exact test. In all 2 × 2 contingency analyses, a continuity correction was applied. Statistical significance was based on a 2-tailed test with α equal to .05. Reported percentages may not total 100% because of rounding.

Results

During the reporting period, 768 (93%) of the 825 eligible patients were tested for HIV infection and included in the study; 98 patients (13%) tested HIV positive, and 670 patients tested HIV negative. The minimum HIV coinfection prevalence (3%) occurred in 1988, and the maximum (20%) in 1991. These data suggest that the dynamics between HIV and TB are undergoing change, but insufficient statistical power was available to permit determination of any trends.

Demographic and life history survey data of the study population are presented in Table 1. HIV coinfection was significantly more common among men, young to middle-aged adults (25 to 44 years of age), Blacks, persons born in the United States, and persons with a history of imprisonment. By contrast, patients with TB who were female, 45 or older, Asian, or born in a foreign country were less likely to be HIV infected. Rates of HIV seropositivity did not vary according to a history of admitted alcoholism, prior homelessness, or receiving blood transfusions between 1978 and 1986.

All adult HIV risk factors were statistically more common in the HIV-positive group (Table 2). Ninety-one HIV-positive patients (93%) and 278 HIV-negative patients (42%) admitted to 1 or more HIV risk factors. Seven HIV-positive patients (7%) had no identifiable HIV risk factors.

HIV screening was not performed on all eligible patients. The demographics of the nonparticipating patients were generally similar to those of the study group, with 1 exception. Twenty-one of the 57 nonparticipating patients (37%) were 65 years of age or older. None of the HIV-positive patients were older than 65. HIV risk factor data were available on nearly 50% of the nonparticipating patients, and of these patients, only 18% had 1 or more HIV risk factors, compared with 42% for the HIV-negative group. These observations suggest that the nonparticipating patients were at low risk for HIV infection.

TABLE 1—Demographics and Life Histories of 768 Adult Patients With TB: Fort Worth, Tex

	HIV Positive (%)[a]	HIV Negative (%)[b]	P
Demographic data			
Male	81 (83)	462 (69)	.006
Foreign born	15 (15)	187 (28)	.007
Age group, y			
18–24	4 (4)	56 (8)	NS
25–44	79 (81)	299 (45)	<.001
45–64	15 (15)	211 (32)	<.001
65 or older	0 (0)	104 (16)	<.001
Race or ethnic group			
White	35 (36)	209 (31)	NS
Black	47 (48)	235 (35)	.018
Hispanic	15 (15)	133 (20)	NS
Asian	1 (1)	93 (14)	<.001
	No. of Patients/Total (%)		
Life history data			
Prior imprisonment	55/88 (63)	265/583 (46)	.004
Prior homelessness	36/91 (40)	195/630 (31)	NS
History of alcoholism	21/94 (22)	176/660 (27)	NS
Blood transfusion (1978–1986)	7/92 (8)	38/632 (6)	NS

Note. NS denotes not statistically significant ($P > .05$). Life history data were not available on all patients. Reported values include only patients with a known status.
[a]n = 98.
[b]n = 670.

TABLE 2—HIV Risk Factors for 768 Adult Patients with TB: Fort Worth, Tex

HIV Risk Factor	HIV Positive No. of Patients/Total (%)	HIV Negative No. of Patients/Total (%)	P
Illicit drug use			
IV drug user	45/96 (47)	90/661 (14)	<.001
Crack cocaine user	37/89 (42)	106/650 (16)	<.001
Other inhaled drugs	60/90 (67)	180/653 (28)	<.001
Sexual practices			
Sex for drugs or money	34/82 (42)	87/622 (14)	<.001
IV drug-using partner	43/82 (52)	107/625 (17)	<.001
HIV-positive partner	19/80 (24)	6/624 (1)	<.001
Homosexual male partner	34/93 (37)	10/635 (2)	<.001
3 or more partners per year	46/77 (60)	151/618 (24)	<.001
1 or more HIV risk factors	91/98 (93)	278/670 (42)	<.001

Note. HIV risk factors were not available for all patients. Sex for drugs or money (i.e., prostitution) included patients either giving or receiving favors for sex.

Discussion

HIV serologic testing and counseling is universally recommended for adult TB patients.[2] This study is the first to examine the outcome of implementing universal screening of TB patients for HIV infection in a major metropolitan area. The study was conducted over a 9-year period and included 93% of reported TB cases. The average prevalence of HIV coinfection during the study period was 13%. One or more HIV risk factors were found in 93% of the HIV-infected group and in 42% of the HIV-negative group.

Ideally, all patients with TB should be tested for HIV infection. In practice, this can seldom be achieved, because some patients die before being screened, refuse to be screened, or are lost to follow-up or move prior to the completion of screening. In our clinic, where HIV screening is offered as a routine part of patient care, 4% of adult patients with TB died without being screened and 3% were not screened because they refused, were lost to follow-up, or moved. Our data indicate that few patients exercise their legal right to refuse HIV screening, and consequently a high participation rate can be achieved.

HIV risk factors were also common in patients of the HIV-negative group, and these patients also had life history characteristics that have been associated with HIV

infection: alcohol abuse, prior homelessness, and prior imprisonment.[9–11] In the HIV-negative group, 42% of patients admitted to 1 or more adult HIV risk factors, 27% admitted to alcoholism, 31% had a history of homelessness, and 46% had a history of imprisonment (Tables 1 and 2). These factors, when taken collectively, indicate that TB patients are at risk for acquiring HIV.

No combination of HIV risk factors identified all HIV-positive patients. Seven percent of the HIV-positive group would not have been detected with targeted screening. While our findings might suggest that HIV screening performed on the basis of HIV risk factors is possible, we do not believe this to be feasible under operational conditions. Developing a suitable protocol that could be used by medical personnel to obtain reliable and repeatable results poses obstacles. Not only are patients reluctant to disclose information of a personal nature, but medical personnel often have differing opinions on how to assess for HIV risk factors. Other studies of TB populations have reported that 5% to 38% of persons testing positive for HIV had no identifiable risk factors.[4–6,12] These widely varying results indicate that either a large percentage of HIV-positive persons have no risk factors or that the presence of risk factors cannot be accurately assessed. Targeted HIV screening based on risk factor assessment should therefore not be considered a reliable methodology.

This study found a high prevalence of HIV coinfection in adult TB patients from a major metropolitan area. Risk factors predisposing to HIV infection were prevalent in both the HIV-positive and HIV-negative groups. The prevalence of alcoholism, prior homelessness, and prior imprisonment was also high in both groups. HIV coinfection of TB patients is a significant problem that presents unique treatment problems and poses a public health threat. The metropolitan TB clinic provides an ideal setting for HIV screening and counseling, as there is both a significant population that is infected with HIV and a large group at risk for HIV infection. Serologic testing defines the patient's HIV status, which is crucial to appropriate medical management. Counseling is a preventive measure designed to educate the patient on the risks of acquiring and transmitting HIV infection. This study supports the recommendation for universal HIV screening of adults with TB. □

Contributors

S. E. Weis led the study design, data collection and analysis, and writing. B. Foresman led the statistical analysis and contributed to the study design and editing. P. E. Cook participated in the study design, data collection, statistical analysis, and writing. K. J. Matty managed the database and participated in data collection, statistical analysis, and writing. All 4 contributors are guarantors for the integrity of the study as a whole.

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