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Acceptability of HIV Testing Among Jail Inmates when Combined with a Blood Test for Tuberculosis

Ank E Nijhawan, MD, MPH, MSCS^{1,2}, Princess A Iroh, MSc¹, Esmaeil Porsa, MD, MPH³

¹Department of Internal Medicine, University of Texas Southwestern Medical Center, Dallas, Texas

²Parkland Health & Hospital System, Dallas, Texas

³Office of Strategy and Integration, Parkland Health & Hospital System, Dallas, Texas

Abstract

Incarcerated individuals are at high risk for HIV and Tuberculosis (TB), though combined screening in the criminal justice system is limited. Newer blood tests for TB provide a unique opportunity to combine HIV and TB testing in corrections. Entering jail inmates were offered routine opt-out HIV testing along with TB screening, both via blood draw. Of 529 individuals enrolled, 524 (99%) agreed to HIV testing. Testing identified 13 (2.5%) previously diagnosed HIV infections and one new positive. One quarter (138, 26%) of participants had never been tested for HIV and were more likely to be young, Hispanic, born outside of the US and incarcerated for the first time. Combined HIV/TB testing had high acceptability among individuals entering jail.

Keywords

HIV testing; incarceration; combined; tuberculosis; acceptability

Introduction

Individuals entering jails and prisons are at disproportionately higher risk for multiple infectious diseases than the general population, including tuberculosis (TB), HIV, hepatitis and sexually transmitted infections (Hammett, Harmon, & Rhodes, 2002). Many of these infections are asymptomatic, transmissible to others, and have improved individual and public health outcomes when detected and treated early (de Voux et al., 2012). As many inmates have poor access to medical care in the community (Conklin, Lincoln, & Tuthill, 2000), incarceration presents a unique opportunity to screen individuals for infectious diseases. Although screening for TB is required by law in most correctional facilities, screening for other infections such as HIV varies widely across the U.S.

Barriers to HIV screening in jail and prison can occur on multiple levels, including individual stigma, competing medical priorities, and security workflow interruptions.

Correspondence to: Ank E. Nijhawan, MD, MPH, UT Southwestern Medical Center Division of Infectious Diseases, 5323 Harry Hines Blvd. Dallas, TX 75390-9169 (office: 214.648.2777; fax: 214.648.7671; Ank.Nijhawan@UTSouthwestern.edu).

Conflicts of interest

Therefore, integrating testing into current processes and infrastructure may increase both the rate and acceptability of testing. Combining or “bundling” testing has the potential to both reduce stigma associated with testing and increase efficiency. Prior studies have shown high rates of acceptability of HIV testing when paired with QuantiFERON Gold-in-Tube (QFT-GIT) testing in a TB outbreak investigation (Person et al., 2010; Stout et al., 2014), though this has not been reported in routine screening in the correctional setting.

We sought to determine (a) whether integrating routine opt-out HIV testing into the blood draw for TB testing with QFT-GIT was acceptable in a large urban jail and (b) to characterize inmates who had never been tested for HIV previously.

Methods

Study Design and Recruitment

This study of opt-out HIV testing combined with TB screening is a secondary analysis of a cost comparison of tuberculin skin tests and QFT-GIT for the detection of latent TB infection (LTBI) for inmates entering the Dallas County Jail (Nijhawan, 2016). The Dallas County Jail houses 6000–7000 inmates at any one time, with approximately 275 inmates entering and leaving the jail daily. Adults entering the jail between June and October 2014 were approached for participation in the study while awaiting LTBI screening. Eligible individuals had to be 18 years or older, able to speak English and provide informed consent. Individuals with known prior positive tuberculin skin test or with a history of severe necrotic reaction to purified protein derivative were excluded from the study. All inmates provided written informed consent and authorization for use and disclosure of health information for research purposes. The University of Texas Southwestern Medical Center Institutional Review Board approved this study.

Study Procedures

Each subject completed a TB/HIV risk questionnaire assessing country of birth, BCG vaccination, past exposure to TB, history of homelessness, prior incarcerations, injection drug use and sexual history. Next, HIV testing was offered to all study participants on an opt-out basis and blood samples were collected by the study phlebotomist for HIV Ab testing (Immunochemiluminometric assay, Labcorp, Inc.) and for QFT-GIT (QIAGEN, performed at Children’s Medical Center of Dallas).

Statistical Analysis

Baseline characteristics were tabulated by frequencies. Multivariate logistic regression was used to determine predictors of never having been tested for HIV. First, crude odds ratios (OR) with 95% confidence intervals (CI) were determined followed by adjusted OR with 95% CI for variables remaining in the model after using a stepwise selection process. Statistical analyses were performed using SAS (SAS Institute Inc. version 9.4, Cary, NC).

Results

Of 576 subjects who were screened for participation in the study, 529 (92%) were enrolled. Thirty-two were ineligible (due to age, prior TB/LTBI or recent tuberculin skin test placement) and 15 refused QFT-GIT and HIV testing (6 reported fear of needles, 2 cited confidentiality and 7 other). The majority of enrollees were male (75%), mean age was 33.5, 46% were Black, 29% White, and 24% Hispanic. Of 396 men, 10 (3%) reported sex with men only, and 10 (3%) reported sex with men and women. Of 132 women, 23 (17%) reported sex with men and women. Prior injection drug use was reported by 17%, prior incarceration by 85% and 14% had stayed in a homeless shelter (Table 1).

Of 529 subjects offered opt-out HIV testing, 524 (99%) agreed to be tested. Of these, 471 (89%) tested negative, 13 (2.5%) were confirmed as known HIV-infected individuals and 1 (0.2%) had a preliminary positive result. In addition, 39 subjects did not have a result due to blood draw failure (26, 4.9%), insufficient quantity of blood (8, 1.5%), missing result (5, 0.9%) or refusal (5, 0.9%). All 5 participants refusing testing reported that they had been recently tested for HIV. All thirteen known HIV-infected individuals were linked to HIV care at the Dallas County Jail. Of these, 8/13 (62%) had been engaged in care prior to incarceration (at least one HIV medical visit within the past 6 months), 9/13 (69%) were receiving HIV treatment prior to incarceration and 4/13 (31%) had an undetectable viral load at the time of entry to jail. The individual with a preliminary positive result was released prior to additional testing being performed.

Overall, 138 (26%) had never been tested for HIV and 14 (3%) reported they did not know if they had ever been HIV tested. On multivariate analyses, those who were younger (age aOR 0.96, 95% CI 0.94–0.98, $p<0.01$), Hispanic (aOR 2.21, 1.31–3.70, $p<0.01$), foreign-born (aOR 2.75, 1.00–7.61, $p=0.05$) and were incarcerated for the first time (aOR 2.96, 1.75–5.01, $p<0.01$) were less likely to have ever been tested for HIV (Table 2).

Discussion

Combined, opt-out testing for HIV and TB had a high acceptance rate among inmates entering the Dallas County Jail, with 99% (524/529) agreeing to HIV testing. Jail inmates had multiple risk factors for HIV, including injection drug use and men who reported sex with men, though at least 26% had never been tested for HIV. Younger, Hispanic, foreign-born individuals and those experiencing their first incarceration were significantly less likely to have been tested for HIV in the past. Of the 2.5% of participants who were known to be HIV-infected, all were linked to HIV care during incarceration.

There is substantial variability of the acceptability of HIV testing in the correctional setting based on what type of testing is provided, the timing of testing, and the manner in which it is offered. Acceptability is high when rapid, point-of-care testing is used (Beckwith et al., 2010) and when samples are obtained by less invasive means, with 64–98% accepting oral swab or fingerstick (Bauserman, Ward, Eldred, & Swetz, 2001) (Beckwith et al., 2011; Beckwith et al., 2012; Calzavara et al., 1995; Centers for Disease & Prevention, 2013) (Spaulding et al., 2015) compared to 22–73% accepting a blood draw, 22–73%) (Beckwith

et al., 2012) (Kendrick, Kroc, Couture, & Weinstein, 2004) (Centers for Disease Control & Prevention, 2013) (Liddicoat et al., 2006). HIV testing also has higher uptake when it is offered early in incarceration (Kavasery, Maru, Cornman-Homonoff, et al., 2009; Kavasery, Maru, Sylla, Smith, & Altice, 2009); and in an opt-out manner (Centers for Disease Control & Prevention, 2011). Therefore, in our study, an acceptance rate of 99% (96% if including those who refused study participation) for opt-out testing for HIV by blood draw is quite high.

Combined testing upon entrance into correctional facilities allows for integration of routine testing for HIV or other infectious diseases into existing protocols and is aligned with national public health priorities. For example, 637/995 (64%) of inmates accepted voluntary HIV testing on serum when combined with syphilis testing (Andrus et al., 1989), and hepatitis C virus testing was successfully integrated into an existing prisoner HIV screening program (Cocoros et al., 2014). Most comparable to our study, pairing HIV with TB screening during an outbreak of TB in a prison resulted in 88% accepting HIV testing (Person et al., 2010). The CDC recognizes that “the current disease-specific prevention approach oftentimes has led to narrow success and missed opportunities for increasing program capacity, leveraging resources, addressing social and structural determinants, and accelerating health impact”, citing a strategic priority to “integrate services at the client level” (Steiner, Aquino, & Fenton, 2013).

With regards to HIV risk factors in our study population, 17% of inmates reported ever injecting drugs and 6% of men reported sex with men. Many of these high-risk individuals, especially those with prior criminal justice involvement, had been previously tested for HIV. Jail may be the first opportunity for HIV testing in those experiencing a first-time incarceration as well as for individuals who may not otherwise seek out testing due to stigma, lack of access, or not believing that they are at risk (Macgowan et al., 2009).

In addition to identifying new HIV diagnoses, HIV testing is an important opportunity to re-engage individuals in HIV care (Flash et al., 2015). In this study we re-identified 13 previously-known HIV-infected individuals, 38% of whom had been out of care. On average, 40% of HIV-infected individuals entering jail and prison are not receiving routine HIV care in the community, and the majority (96% of known HIV-infected) are re-engaged in care during incarceration (Iroh, Mayo, & Nijhawan, 2015).

A limitation of this study is that it was conducted in a single large urban jail, therefore the findings may not be generalizable to other correctional settings. However, our finding of acceptability of combined HIV and TB testing is supported by the literature. Second, this study excluded non-English speakers, therefore our findings may not apply to that specific population. Lastly, the survey data did not include a detailed sexual history (e.g. lifetime sexual partners, condom use), and may underestimate HIV risk behavior.

In sum, we found a high rate of acceptance for opt-out HIV testing in a jail setting when testing was combined with QFT-GIT testing for TB. Given the high burden of transmissible and often asymptomatic infectious diseases in the criminal justice population, combining

testing for HIV and TB is a high-value, client-centered approach which has significant public health impact while leveraging existing resources.

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Table 1

Baseline Characteristics

Characteristic	Overall 529 (100%)
Gender	
Male	397 (75%)
Age, mean (years)	33.5
18–29	242 (46%)
30–39	137 (26%)
40–49	91 (17%)
>50	59 (11%)
Ethnicity	
Hispanic	128 (24%)
Non-Hispanic	303 (57%)
Unknown	97 (18%)
Race	
Black	244 (46%)
White	151 (29%)
Native American/Alaskan Native	21 (4%)
Asian	4 (1%)
Pacific Islander/Native Hawaiian	1 (<1%)
Other	122 (23%)
Foreign-born	19 (4%)
Sexual partners--women	132
Report sex with men only	98 (74%)
Report sex with women only	8 (6%)
Report sex with men and women	23 (17%)
Report not sexually active	3 (2%)
Sexual partners--men	396
Report sex with men only	10 (3%)
Report sex with women only	373 (94%)
Report sex with men and women	10 (3%)
Report not sexually active	3 (<1%)
Other risk Factors	
Ever stayed in a homeless shelter	75 (14%)
First incarceration	81 (15%)
Ever Injected Drugs	89 (17%)

Table 2

Unadjusted and Adjusted Odds of Never Having Been Tested for HIV

	Unadjusted OR	P value	Adjusted OR	P value
Male gender	1.51 (0.95–2.39)	0.08	1.63 (0.97–2.74)	0.06
Age, mean (years)	0.95 (0.94–0.97)	<0.01	0.96 (0.94–0.98)	<0.01
Race/Ethnicity				
Non-Hispanic Black	Ref		Ref	
Non-Hispanic White	1.18 (0.71–1.96)	0.53	1.45 (0.84–2.49)	0.18
Hispanic	3.18 (1.99–5.08)	<0.01	2.21 (1.31–3.70)	<0.01
Other	1.86 (0.87–3.98)	0.11	1.79 (0.81–3.96)	0.15
Foreign-born	4.68 (1.92–11.40)	<0.01	2.75 (1.00–7.61)	0.05
HIV risk factor				
IDU	Ref		--	--
MSM	1.88 (0.52–6.85)	0.34	--	--
Heterosexual	1.87 (1.06–3.30)	0.03	--	--
Homeless	0.69 (0.39–1.23)	0.21	--	--
First incarceration	3.54 (2.20–5.72)	<0.01	2.96 (1.75–5.01)	<0.01

Bold P values are to 0.05.

Definition of abbreviations: HIV= Human Immunodeficiency Virus; Ref= reference category, IDU= injection drug use; MSM= men who have sex with men