Infections Missed by Urethral-Only Screening for Chlamydia or Gonorrhea Detection Among Men Who Have Sex With Men

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Abstract: In a retrospective analysis of asymptomatic men who have sex with men visiting an urban municipal sexually transmitted disease clinic, 83.8% of chlamydial and gonococcal infections would have been missed by urethral screening, compared with 9.8% by screening the rectum and pharynx. Extragenital screening is critical to the provision of comprehensive sexual health services for men who have sex with men.

Chlamydia trachomatis and *Neisseria gonorrhoeae* infections are the 2 most commonly reported notifiable diseases in the United States. In 2008, there were over 1.2 million cases of chlamydia and 330,000 cases of gonorrhea reported to the Centers for Disease Control and Prevention,[1] and both infections have been associated with increased risk of transmission and acquisition of human immunodeficiency virus (HIV) infection.[2] The Centers for Disease Control and Prevention recommends that sexually active men who have sex with men (MSM) with relevant exposures be screened for urethral and rectal gonorrhea and chlamydia, and for pharyngeal gonorrhea, at least annually and every 3 to 6 months for men at highest risk.[3] However, many MSM are not screened at the recommended frequency.[4,5] In a national study conducted during 2003–2005, only 36% of MSM reported being tested for gonorrhea at any anatomical site in the prior year.[6]

Although nucleic acid amplification tests (NAATs) have significantly higher diagnostic sensitivity than culture,[7,8] they have not been cleared by the Food and Drug Administration for rectal or pharyngeal testing for gonorrhea or chlamydia. NAATs can be validated by individual laboratories for use at extragenital anatomical sites,[9,10] and now are more available in large metropolitan areas because the 2 largest commercial laboratories in the United States, as well as many public health laboratories, have validated NAATs for extragenital use.[10] However, screening for rectal and pharyngeal infections continues to be less common than screening for urethral infections among MSM.[10] Because rectal and pharyngeal infections are mostly asymptomatic,[11] screening only for urethral infections can leave infections unidentified and allow for ongoing disease transmission among MSM.[12]

A 2003 study conducted in San Francisco, in which NAATs were used to test MSM for chlamydia and gonorrhea at all 3 anatomical sites, found that the majority of chlamydial (53%) and gonococcal (64%) infections would be missed if MSM were screened only for urethral infections.[11] As a result of that analysis, the San Francisco Department of Public Health recommends that sexually active MSM be screened for chlamydia and gonorrhea every 3 to 6 months at the rectum and pharynx, but not the urethra, except for patients seen at the municipal sexually transmitted disease (STD) clinic where all 3 anatomical sites are screened based on reported exposures.[13] To identify an appropriate screening strategy for MSM, there is a need for current data on the prevalence of chlamydial and gonococcal infections at all 3 anatomical sites, particularly among men who are asymptomatic and therefore unlikely to seek diagnostic testing. Because the data on which San Francisco Department of Public Health's recommendations are based are over 7 years old, we reexamined the prevalence of chlamydial and gonococcal infections by anatomical site among MSM visiting the municipal STD clinic in San Francisco to determine whether earlier findings remain applicable. The objective of this study was to identify the proportion of chlamydial and gonococcal infections that would be missed by different screening practices among MSM.

We conducted a retrospective analysis of MSM who visited San Francisco's STD clinic, City Clinic, during 2008–2009 and who were screened for urethral, pharyngeal, and rectal chlamydia and gonorrhea. MSM were offered rectal or urethral screening if they reported any receptive or insertive anal sex, respectively, even if with a condom, in the prior 6 months, and pharyngeal screening if they reported performing fellatio in the prior 2 weeks. MSM were defined as males who identified as gay or bisexual or who reported sex with male partners at the current or any prior clinic visit. We included MSM who were found to be infected with gonorrhea or chlamydia at one or more anatomical sites. To assess screening rather than diagnostic testing, we excluded men if they had symptoms (i.e., urethral discharge or dysuria, rectal discharge, proctitis, or sore throat) or reported being a contact to a partner with an STD. For the urethral site, a first-catch urine specimen was collected. All specimens were tested using NAAT-based methods (GenProbe APTIMA Combo2, San Diego, CA) at the San Francisco Department of Public Health, Public Health Laboratory, which had previously verified the test's performance for chlamydia and gonorrhea detection in pharyngeal and rectal specimens.[9]

To assess the prevalence of infection at each anatomical site, we calculated the urethral, rectal, and pharyngeal positivity

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TABLE 1. Prevalence of Chlamydial and Gonococcal Infection by Anatomic Site Among Asymptomatic Men Who Have Sex With Men (N = 3398)—San Francisco City Clinic, 2008–2009

Site of Infection	Chlamydia, % (95% CI)	Gonorrhea, % (95% CI)
Urethra	2.3 (1.8–2.9)	0.4 (0.2–0.6)
Rectum	7.8 (6.9–8.8)	3.6 (3.0–4.2)
Pharynx	1.9 (1.5–2.5)	5.0 (4.3–5.8)

CI indicates confidence interval.

for chlamydia and gonorrhea, and corresponding 95% confidence intervals (CI) assuming a binomial distribution. To assess different screening practices, we calculated the proportion of chlamydial or gonococcal infections that would have been missed by the following screening practices: urine only, rectum only, pharynx only, urine and pharynx, rectum and urine, and rectum and pharynx. Statistical analyses were conducted in SAS 9.1 (SAS Institute, Cary, NC). The data were deidentified for retrospective analysis and evaluated for the purpose of public health improvement; thus, this study was considered exempt from human subjects' considerations in accordance with the Code of Federal Regulations, Title 45.

During 2008–2009, there were 3398 patient visits to City Clinic by asymptomatic MSM who were tested for chlamydia and gonorrhea at all 3 anatomical sites (i.e., urethra, pharynx, and rectum). Chlamydial or gonococcal infection was found in at least one anatomical site at 549 (16.2%) of those visits. The prevalence of chlamydial and gonococcal infection by anatomical site ranged from 0.4% (95% CI, 0.2%–0.6%) for urethral gonorrhea to 7.8% (95% CI, 6.9%–8.8%) for rectal chlamydia (Table 1). Concurrent chlamydial and gonococcal infection was found in the urethral, rectal, and pharyngeal sites in 1 (<0.1%), 29 (0.9%), and 6 (0.2%) visits, respectively. The proportions of chlamydial and gonococcal infections that would be missed by different screening practices are presented in Figure 1. For gonorrhea, screening only for urethral infec-

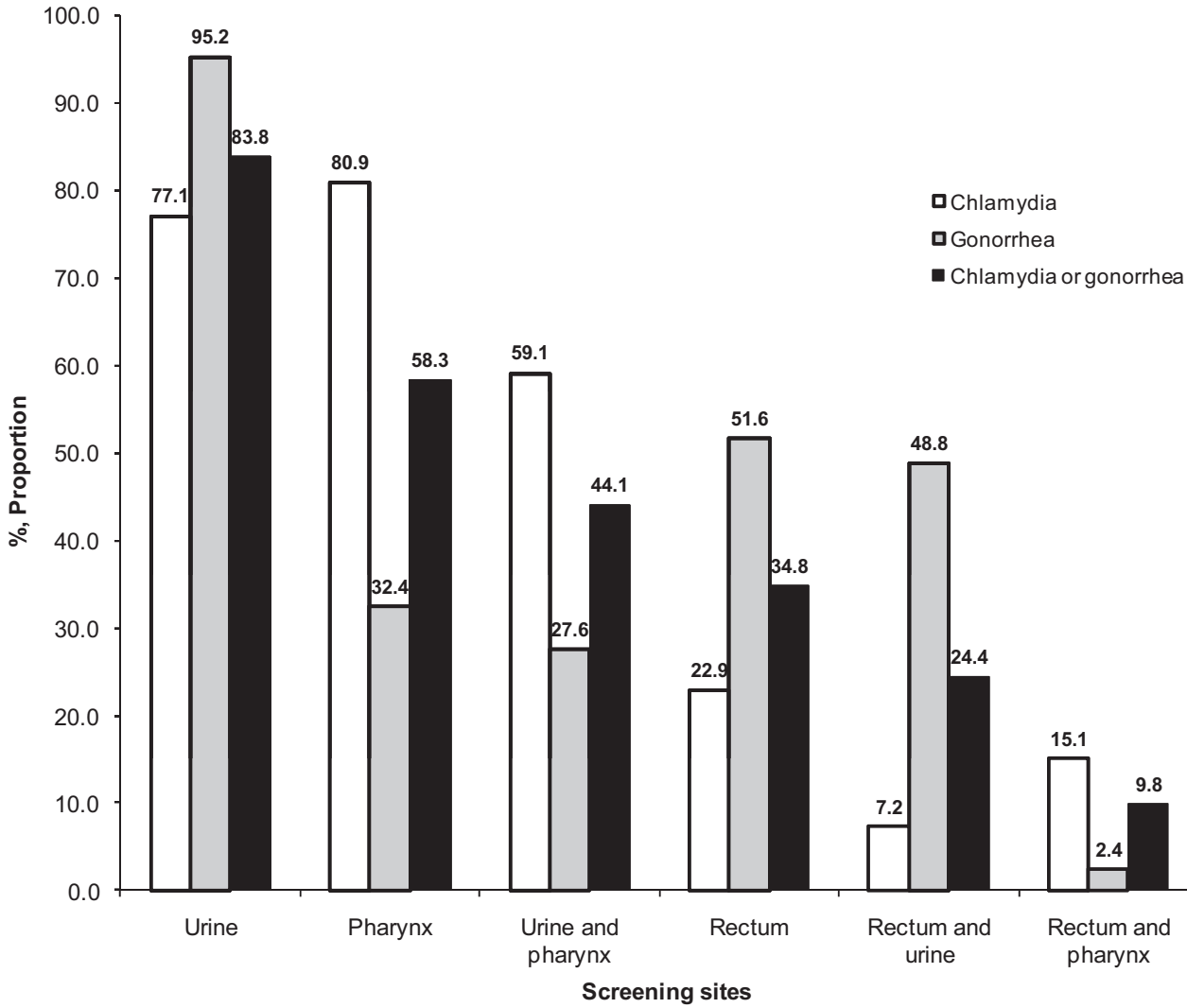

Figure 1. Proportions of chlamydial and gonococcal infections among asymptomatic men who have sex with men that would be missed by different screening practices—San Francisco City Clinic, 2008–2009.

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tions would miss the most infections (95.2%; 95% CI, 91.8%–97.5%), while screening the rectum and pharynx would miss the fewest (2.4%; 95% CI, 0.9%–5.2%). For chlamydia, screening only the pharynx would miss the most infections (80.9%; 95% CI, 76.3%–84.9%), whereas screening the rectum and urethra would miss the fewest (7.2%; 95% CI, 4.7%–10.5%). Screening only for urethral infections would miss the most of either chlamydial or gonorrheal infections (83.8%; 95% CI, 80.4%–86.8%), whereas screening the rectum and pharynx would miss the fewest of either infection (9.8%; 95% CI, 7.5%–12.6%).

In this retrospective analysis of asymptomatic MSM screened for chlamydia and gonorrhea at an urban STD clinic, we found that 83.8% of chlamydial and gonococcal infections would have been missed by screening only for urethral infections, compared with only 9.8% of infections missed by screening the rectum and pharynx. These data indicate that screening the rectum and pharynx is a more effective strategy for case detection than screening only for urethral infections. Neither San Francisco nor Seattle[14] recommends screening for urethral infections among MSM because of the rarity of asymptomatic urethral infections in the absence of concomitant rectal or pharyngeal infection. To control the ongoing spread of chlamydial and gonococcal infections and potentially reduce the risk of HIV transmission among MSM, efforts are needed to expand the availability and use of rectal and pharyngeal NAAT testing for this population. Expanded extragenital testing would identify a larger pool of infected persons, thus reducing endemic levels of disease among MSM.

We found a higher proportion of infections missed by urethral screening than was found in a prior study of MSM in San Francisco.[11] Although it is possible that the epidemiology of gonorrhea and chlamydia among MSM has changed since that study was conducted, we most likely identified a higher proportion of missed infections because we excluded MSM who had symptoms or reported contact with infected partners. This allowed us to evaluate visits to the clinic that were for routine screening rather than diagnostic testing. Another explanation for the higher proportion of missed infections in our study is a change in test methodology; the prior study used the BD ProbeTec NAAT, which has a lower performance profile than the APTIMA NAAT used in this study.

In a review of morbidity in San Francisco among males in 2009, we found that 45.1% and 57.5% of the total chlamydia and gonorrhea morbidity, respectively, would have been missed if testing were only for urethral infections (data not shown). Although many MSM report rectal and pharyngeal exposures, NAAT testing is not routinely available to MSM in other jurisdictions.[4,10] Gonorrhea and chlamydia interventions that focus solely on urethral disease might miss important reservoirs of infection and have limited impact on local disease burden.

Our analysis is subject to several limitations. First, data presented here are limited to MSM seen at the municipal STD clinic and might not be representative of all MSM in San Francisco. Second, San Francisco is a unique urban environment, and our results might not be generalizable to other settings.

Extragenital screening for sexually active MSM is critical to the provision of comprehensive sexual health services for this population. We found that a substantial burden of chlamydial and gonococcal infection would be left untreated if screening were only for urethral infections. Most asymptomatic MSM who were diagnosed with chlamydia or gonorrhea at the STD clinic were infected in the rectum or pharynx. To successfully reduce the burden of STDs among MSM, a group at increased risk for HIV and other STDs, NAAT-based screening at extragenital sites should be widely available to this population and providers should be educated about appropriate screening practices. Future studies should evaluate the epidemiology of chlamydial and gonococcal infections in other MSM communities and the cost-effectiveness of different screening practices in this population.

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