

ABSTRACT

Introduction: Recommendations from the CDC call for pharyngeal screening of *Neisseria gonorrhoeae* (GC) and rectal screening of GC and *Chlamydia trachomatis* (CT) in HIV-infected and at-risk men who have sex with men (MSM). There are currently no recommendations to routinely screen women at extragenital sites. Our aim was to define the prevalence of extragenital GC and CT in women accessing care at two public STD clinics in Baltimore and compare it to the prevalence of extragenital infections in MSM and men who have sex with women (MSW).

Methods: All patients who reported extragenital exposures between 6/1/2011 and 5/31/2013 were included in this analysis. We used logistic regression models to identify risk factors for extragenital infections. Point estimates with 95% confidence intervals (CI) are presented.

Results: A total of 10,539 patients were included in this analysis (88% African American, mean age 29 years, 42% women, 7% MSM, 2.5% HIV infected). The prevalence estimates of any extragenital GC and CT were: 2.4% [95% CI: 1.9-2.9] GC and 3.7% [95% CI: 3.1-4.4] CT in women; 2.6% [95% CI: 2.2-3.1] GC and 1.6% [95% CI: 1.3-2.0] CT in MSW; 18.9% [95% CI: 16.0-22.0] GC and 11.8% [95% CI: 9.4-14.5] CT in MSM. Among women, 30.3% (95% CI: 23.4-37.9) of all cases of GC and 13.8% (95% CI: 10.7-17.6) of all cases of CT would have been missed had extragenital testing not been performed! Age less than or equal to 18 years was the strongest predictor of extragenital infections in women—it was associated with increased probability of pharyngeal GC [OR 3.85, 95% CI 1.9-7.9], pharyngeal CT [OR 3.74, 95% CI 1.8-7.9], and rectal CT [OR 23.57, 95% CI 7.2-76.8]. IV drug use was only associated with an increased risk of pharyngeal GC [OR 5.59, 95% CI 1.5-20.4].

Conclusions: Although the prevalence of extragenital gonorrhea and chlamydia is highest among MSM, nearly one third of gonorrhea cases in women would be missed with genital-only testing. Screening for rectal CT, pharyngeal CT and pharyngeal GC should be considered in young women attending STD clinics when extragenital exposures are reported.

INTRODUCTION & HYPOTHESES

•CDC recommends all exposed HIV-infected and at-risk MSM be screened for rectal and pharyngeal GC and CT¹

•Data on prevalence of extragenital GC and CT in women are much more limited. As a result, **no formal recommendations exist at this time.**

•Up to 90% of extragenital GC and CT are asymptomatic and may be sexually transmitted^{2,3}

•The throat may be the site of resistance acquisition for GC⁴

Objective 1

Define the prevalence of extragenital GC and CT in women and compare to MSM and MSW

Objective 2

Identify risk factors in women for extragenital STIs

Objective 3

Determine the proportion of infections that would have been missed had only genital testing been performed

Hypotheses

1) High risk women attending STD clinics will have asymptomatic GC and CT

2) A significant proportion of infections would be missed if genital only testing were performed

METHODS

• IRB-approved retrospective cohort study of the first visit of all men and women who presented to the Baltimore City Health Department Eastern Health District or Druid Health Center STD Clinics between 6/1/2011 and 5/31/2013 and who reported extragenital exposures

• A standardized clinical assessment was performed including a detailed history and physical examination. All data were recorded in an electronic clinical database

• Pharyngeal and rectal GC were detected by nucleic acid amplification testing (NAAT); genital gonorrhea was detected by culture; pharyngeal, rectal and cervical CT were detected by NAAT; non-gonococcal urethritis in men was diagnosed using standard Gram stain criteria- men were not tested for urethral CT

• Data analyses were performed using STATA v.12.1 (STATA Corp, College Park, TX) We calculated point estimates of prevalence and 95% confidence intervals (CI). Logistic regression models were used to identify predictors of extragenital infections in women.

RESULTS

Total N = 10539	Overall	Women(N=4402)	MSM (N=769)	MSW(N=5218)
Sex				
F	42% (N=4402)	-	-	-
M	58% (N=6111)	-	-	-
T	<1% (N=26)	-	-	-
Race				
Black	88% (N=9260)	88% (N=3867)	79% (N=604)	89% (N=4658)
White	8% (N=799)	8% (N=338)	15% (N=118)	6% (N=332)
Hispanic	3% (N=282)	2% (N=101)	4% (N=30)	3% (N=144)
Other	2% (N=198)	2% (N=96)	2% (N=17)	2% (N=84)
Age				
≤18	7% (N=765)	10% (N=460)	7% (N=55)	5% (N=245)
19-30	60% (N=6359)	63% (N=2775)	66% (N=510)	57% (N=2987)
>30	32% (N=3415)	27% (N=1167)	27% (N=204)	38% (N=1986)

Predictors of extragenital infections in women

Age ≤ 18 years*

Pharyngeal GC [OR 3.79, 95% CI 1.8-7.8]
Pharyngeal CT [OR 3.74, 95% CI 1.8-7.9]
Rectal CT [OR 23.57, 95% CI 7.2-76.8]

Age 19-30 years*

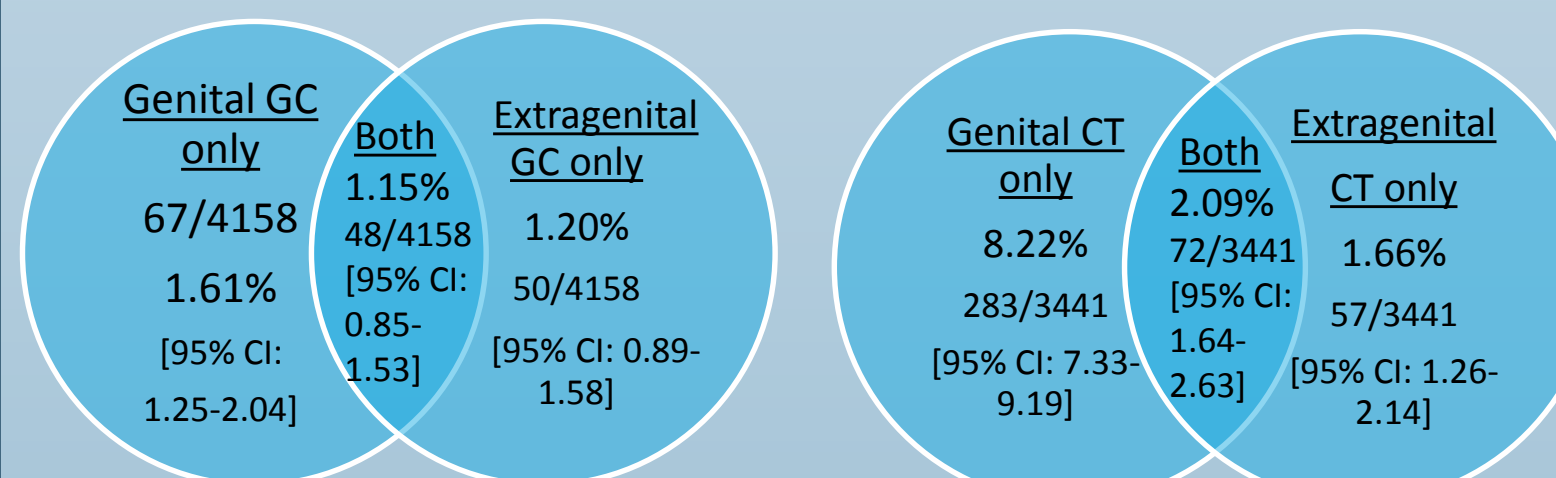
CT pharyngeal: 2.13 (1.1-4.0)
CT rectum: 5.52 (1.9-15.9)

*GC→Pharyngeal odds ratios were adjusted for race, sexual orientation, and IV drug use. Rectal odds ratios were adjusted for race, and sexual orientation

*CT→Pharyngeal odds ratios were adjusted for race, and sexual orientation. Rectal odds ratios were adjusted for race, and sexual orientation

*Compared to age > 30 years

Prevalence of Infections in Women



Among women, **30.3% (95% CI: 23.4-37.9) of all cases of GC and 13.8% (95% CI: 10.7-17.6) of all cases of CT would have been missed had extragenital testing not been performed.**

Prevalence of Extragenital STIs in Men

Men who have Sex with Women (MSW)

- Extragenital GC: 2.6% [95% CI: 2.2-3.1]
- Extragenital CT: 1.6% [95% CI: 1.3-2.0]

Men who have Sex with Men (MSM)

- Extragenital GC: 18.9% [95% CI: 16.0-22.0]
- Extragenital CT: 11.8% [95% CI: 9.4-14.5]

CONCLUSIONS

- Prevalence of extragenital GC and CT is highest among MSM
- Nearly one-third of GC cases and ~14% of CT cases in women would be missed with genital-only testing
- Age <18 years was the strongest predictor of extragenital infections in women

IMPLICATIONS

- Screening for pharyngeal GC should be considered in young women attending STD clinics when extragenital exposures are reported
- The prevalence of extragenital-only CT in women was lower (but not insignificant)
- Further studies are needed to better define the burden of extragenital STIs in women and the cost-benefit of screening

LIMITATIONS

- Only those who reported extragenital exposures were tested
- Not all individuals were tested at all sites (genital, rectal, pharynx)
- Testing for genital GC was based on culture, thus, the proportion of those missed by a genital-only testing approach is likely an overestimate because culture is less sensitive than NAAT
- External validity: STD clinic population studied— may not be generalizable to other populations

REFERENCES

¹Centers for Disease Control and Prevention. Sexually Transmitted Disease (STDs) Treatment Guidelines, 2010. Morbidity and Mortality Weekly Report 2010; 59 (12):12-13.

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³Jones RB, Rabinovitch RA, Katz BP, et al. Chlamydia trachomatis in the pharynx and rectum of heterosexual patients at risk for genital infection. *Annals of Internal Medicine.* 1985;102:757-62.

⁴Bolan GA, Sparling F, and Wasserheit JN. The Emerging Threat of Untreatable Gonococcal Infection. *N Engl J Med.* 2012; 366(6): 485-487.