

Implementation of Oral and Rectal NAAT Testing for *N. gonorrhoeae* and *C. Trachomatis* Detection as a Component of Local Health Department Outreach Testing

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Introduction

High rates of *N. gonorrhoeae* (GC) and *C. trachomatis* (CT) infections continue to be reported from the Southern region of the United States. The 2013 CDC STD Surveillance report ranked North Carolina #11 in the U.S. for reported chlamydial infections (496.5/100K) and #9 for gonococcal infections (140.1/100K). Asymptomatic infection at the oropharyngeal, genital and/or rectal sites may serve as reservoirs of GC/CT as well as amplify HIV transmission efficiency. Screening initiatives represent an important element of the control strategy for these pathogens.

Current protocols at the Forsyth County, North Carolina STD clinic utilize nucleic acid amplification-based testing (NAAT) to detect infection with GC and/or CT at genital sites, but use culture, a less sensitive method, to detect GC infection at oropharyngeal or rectal sites. Extra-genital chlamydial infection is not tested for under the current protocol.

A recent county initiative funded expansion of testing to allow implementation of extra-genital GC/CT screening in outreach testing venues (patient-collected rectal swabs/provider-collected oral swabs) as well as NAAT-based testing (alongside culture) in the STD clinic (provider-collected swabs). It was our aim to provide local evidence regarding the burden of extra-genital gonococcal and chlamydial infection in order to inform future policy decisions related to the availability of extra-genital testing in the public health setting.

Methods

A retrospective chart review was conducted for all male and female patients aged 12-80 who reported to an outreach site or STD clinic (MSM only) January 1, 2014 to May 31, 2015. The initiative focused on the MSM population, as previous studies have found this group to have a significant risk for extra-genital sexually transmitted infections (STI).

Results

Table 1: The Prevalence of *N. gonorrhoeae* and *C. trachomatis* Infection by Testing Facility and Anatomic Site.

Testing Facility	Outreach (N=247*)			STD Clinic (N=221**)	
	Gender		Total Positive	Gender	
STI Type/ Anatomic Site	Male (n=100)	Female (n=147)		Total # of Tests	Male (n=221)
GC/ Pharyngeal	3	2	5 (2.2%)	27	200
GC/Rectal	2	1	3 (4.3%)	25	153
GC/Genital	0	2	2 (0.9%)	25	219
CT/Rectal	4	2	6 (8.6%)	28	153
CT/Genital	2	9	11 (4.8%)	8	219
Syphilis/ Blood	4	1	5 (2.5%)	32	213
HIV/Blood	2	0	2 (1.0%)	11	170

*1 of n=247 participants was a female to male transgender. All tests returned negative results.

**1 of n=221 participants was a male to female transgender individual. HIV result was positive and all other results were negative.

Twenty-six of the 27 GC or CT infections identified through outreach testing (96.3%) were asymptomatic at time of testing. Four concordant GC/CT infections (same infection at different anatomic sites or infections with different pathogens at the same site) were noted. Two rectal GC (66.7%), 5 pharyngeal GC (100%), and 4 rectal CT (66.7%) infections would have been missed without extra-genital NAAT screening.

Sixty-four (56.6%) of 113 GC or CT infections identified in clinic were asymptomatic. Six of 11 (54.5%) HIV-infected individuals were co-infected with GC and/or CT at the time of testing. Four of the 6 (66.7%) HIV infections were newly identified at the time of testing. Five rectal GC (20.0%), 11 pharyngeal GC (40.7%), and 19 rectal CT (67.9%) infections would have been missed in the absence of extra-genital NAAT testing.

Table 2: Comparison of *N. gonorrhoeae* Rectal and Pharyngeal NAATs with Accompanying Cultures from Clinic Testing.

Anatomic Site	NAAT Tests		Culture Tests	
	# Positive	Number of Tests	# Positive	Number of Tests
Rectal	25 (16.6%)	151	12 (7.9%)	151
Pharyngeal	25 (12.8%)	195	10 (5.1%)	195

When NAAT and bacterial culture for GC were run on the same samples from clinic patients, culture only detected 48% (12/25) of the rectal and 40% (10/25) of the pharyngeal infections detected by NAAT.

Conclusions

A significant prevalence of extra-genital GC and CT infections were noted in both clinic and outreach populations. In the absence of extra-genital NAAT-based testing, approximately half of rectal GC infections would have been missed or ineffectively treated using culture-based methods, increasing risk for ongoing transmission and potentially facilitating the evolution of resistant gonorrhea. More than half of rectal CT infections would have been untreated. The high HIV/STI co-infection rates in this population, along with the high rectal GC/CT prevalence, highlight the fact that the population served is at increased risk of future HIV acquisition. Assurance of access of NAAT-based extra-genital testing is critical for HIV/STI control efforts.

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