**Utility of a Screening Questionnaire in the Emergency Department
to Predict Chlamydia and Gonorrhea Infection**

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Background and Objectives

CT and GC are the two most commonly reported notifiable diseases in the US. Reported cases of CT exceeded 1 million for the first time in 2006 with 1,030,911 cases. The rate in Illinois rose a more modest 11.4% during that time. Reported cases of GC in Illinois were more stable with 358,366 cases in 2006. Females aged 15-19 had the highest infection rates of any group for both CT and GC at 2,862.7 and 647.9/100,000, respectively. Sangamon County reported 1,223 cases of CT and 702 cases of GC in 2009, equivalent to the 6th and 2nd highest rates of infection of all Illinois counties, respectively.

It has been shown that adolescents aged 11-21 comprised 15.8% of all emergency department (ED) visits, and that emergency care accounted for 21.6% of health care visits for young adults (aged 20-29). The prevalence rates of patient presenting to the ED have been reported as high as 11% for CT, 5% for GC, and 15% overall. Self-reported data showed that 4.1% of those with CT infection and 10.7% of those with GC reported going to an ED for treatment. In Illinois, hospitals/EDs reported 25.4% of all CT cases, and were the greatest source of reported GC cases at 34.4%.

The data show that the prevalence for either disease in ED patients is likely greater than that of the general population. Unfortunately, there are no known reliable clinical indicators of infection which may be observed during an ED visit. EDs patients present with an increased likelihood of infection (versus the general population), but clinicians are unable to rely upon clinical presentations to accurately diagnoses infection status, and patients are therefore inappropriately treated (if not infected) or allowed to leave and unlikely to return.

Our objective was to determine if patient responses to a sexual health, history and activity survey at ED admittance are useful in identifying those at increased risk of CT/GC infection.

Methods

From Jun 2011-Feb 2012, female patients aged 15-24 (younger) and 24-35 (older) presenting to an ED were asked to complete a survey and provide a urine sample for CT/GC testing. Patients were provided a $10 cash incentive. Surveys were analyzed for associations between patient demographics and sexual history and activity question responses and subsequent infection with CT, GC or both. Samples were analyzed by the Illinois Department of Public Health laboratory using a nucleic acid amplification test (NAAT, BD ProbeTec). Statistical analyses were performed with SPSS (v19.0; Chicago, IL).

Results

As of March 1, 2012 there were 318 participants (139 younger and 179 older) who completed the survey and provided a urine sample. Participants had a mean age of 25.6 (s.d. 4.8); were 59% white and 40% black; 65.7% publically insured; 96.5% were sexually active in the past year; 13.5% used oral contraceptive pill; 79.9% had ever been pregnant and 38.4% had ever been told they have an STI. Patient responses to the sexual activity survey are shown in Table 1.

Sample analysis results are shown in Table 2. There were a total of 29 individuals infected.
- Patients aged 15-24 were more likely to be infected (both/either) than those aged 25-39 (RR=1.48; p=0.049).
- Blacks were more likely to be infected with GC than whites (all ages; 8 (6.3%) versus 3 (1.6%); RR=1.87; p=0.030).

Logistic regression—Age and number of male partners in the past 3 and 12 months (M3, M12) were each independently significantly associated with infection (Either) at significance of 0.050, 0.013 and 0.006, respectively. However, significance was not retained in a multivariate model.

Chi-square analysis—Dichotomizing the number of male partners into 0-1 and 2+ was also significant, with 2+ at M3 infected at 18.9% (versus 7.2%; p=0.015) and with 2+ at M12 infected at 17.2% (versus 4.5%; p=0.000). Infection (CT or GC) was also associated with the thought that the patient's **c**urrent **p**artner had **o**ther **p**artners (CPOP; RR = 2.71; p=0.023), insurance status (positivity rates for private, public and uninsured at 1.9, 9.1 and 16.1%, respectively; p=0.037), and self-described likelihood of current infection (with 20% answering 'very' and 100% answering 'completely' infected versus 6.5% of 'not at all' and 17.0% of 'slightly'; p=0.000).

Sensitivity analysis thus shows that the screening of all those who report 'Yes" to CPOP or 2+ at M12 would:
- reduce the number of patients screened by 51.9% (to 153 from 318);
- identify 82.8% infected individuals (13/18 CT-only, 8/8 GC-only, 3/3 dual);
- increase the sample positivity rate from 5.03% (21/318 CT and 11/318 GC) to 8.82% (16/153 CT and 11/153 GC), and;
- increase the proportion of those testing positive from 9.1% (29/318) to 15.7% (24/153).

Conclusions

This project accomplished several objectives. First, we demonstrated that the opportunistic screening of females admitting to the ED, for any reason, is feasible. Though not quantitatively evaluated, patient participation exceeded 80% of those approached. Further work will need to be done to determine if the $10 financial incentive was indeed necessary and to examine other personnel issues. We also showed that patient responses to simple questions concerning their sexual activity and history can be used to more effectively target limited ED resources towards those more likely to be infected. Screening those answering "Yes" to either of two questions - if their sex partner has other partners or if they've had 2+ male sex partners in the past year - would **identify** 83% of those infected, **reduce** the number of tests by 52%, and **increase** the proportion of those testing positive by 73%. Further work will need to be done to determine how these questions may be integrated into the patient admittance procedure in a consistent and sensitive fashion.