

Cutting the time to treatment of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) with near-patient molecular diagnostics: the utility of the Cepheid GeneXpert® system



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Background

In 2016, there were an estimated 420,000 diagnoses of STIs in England.¹ Of these, 49% were CT and 9% NG.¹ Transmission rates remain high, and Public Health England recommends “rapid, open access to treatment and partner notification to reduce the risk of STI complications and infection spread.”¹

Near-patient testing of CT/NG facilitates earlier diagnosis, reduces time to treatment (especially in asymptomatic individuals), and may confer a public health benefit in preventing onward transmission and reducing morbidity from infection.² The Cepheid GeneXpert® system delivers near-patient molecular detection of CT/NG, with results available in 90 minutes. It utilises “next-generation” NAAT technology, with highly accurate, reproducible and rapid results.³

In April 2016, the West London Centre for Sexual Health relocated to 10 Hammersmith Broadway. Off-site laboratory NAAT testing, with a median turnaround time to result of seven days, was replaced entirely by an on-site Cepheid GeneXpert with automated notification of results via SMS. Symptomatic and asymptomatic patients are tested on the GeneXpert.

Aims and Objectives

1. Comparison of time to treatment of CT/NG pre- and post-introduction of the Cepheid GeneXpert
2. Calculate the public health impact of this intervention by modelling partners spared exposure to CT/NG through reduced time to treatment

Methods

A case-control study was undertaken, comparing 100 sequential patients diagnosed with CT or NG before (April 2015) and after (April 2016) introduction of the GeneXpert. Patients were identified using GUMCAD diagnostic codes.

Exclusion criteria:

- All patients with positive microscopy for NG, treated on the day of attendance
- Patients with CT treated for NGU on the day of attendance
- Contacts of NG and CT treated on the day of attendance

The case notes of each cohort were reviewed. Time from attendance to treatment was measured. We modelled the number of partners spared exposure due to earlier treatment of CT/NG using self-reported sexual history over the previous three months. The assumption was made that the rate of new sexual partners remained the same and was spaced equally in time in the interval between testing and treatment for CT/NG.

Results

See Table 1. Of the pre-GeneXpert cohort, 40% were male, of whom 66% identified as MSM. Median age was 28yrs (range: 15-69 yrs) and 50% had symptoms. Post-GeneXpert, 61% were male of whom 56% identified as MSM. Median age was 31yrs (range: 14-70 yrs), and 28% were symptomatic.

The majority of patients were diagnosed with CT in both cohorts (83 vs. 74). None of the patients was co-infected with CT and GC.

Following introduction of the GeneXpert, the time from testing to treatment was reduced by 6.2 days. The number of partners exposed/100 index patients was 19.9 pre-GeneXpert and 9.12 post-GeneXpert.

| | Pre-implementation of GeneXpert (n=100) | Post-implementation of GeneXpert (n=100) |
|---|---|--|
| Male (%) | 40 | 61 |
| Age (median [range]) | 28.1 [15-69] | 30.6 [14-70] |
| MSM/WSW | 33/0 | 37/1 |
| Symptomatic | 50 | 28 |
| Time to treatment (days (mean) [SD]) | 9.5 [13.23] | 3.3 [4.94] |
| Sexual partners in preceding 3 months (mean [SD]) | 2.1 [1.71] | 4.0 [10.48] |
| Partners exposed in interval between test and treatment/100 index cases | 19.9 | 9.12 |

Table 1

Discussion

Use of the GeneXpert reduced time to treatment from a mean of 9.5 to 3.3 days (a 66% reduction). Modelling data suggest 54% fewer partners were exposed to CT/NG due to earlier diagnosis and intervention, resulting in reduced opportunities for STI transmission. Aside from the individual benefit, a rapid, definitive diagnosis of CT/NG supports more thorough partner notification and improved antibiotic stewardship, avoiding ‘syndromic management’ which has contributed to the development of antibiotic resistance.

Conclusion

This study supports the adoption of near-patient testing strategies in sexual health services as a method of ensuring earlier treatment and less STI transmission. Given these data, it will be interesting to see if a move to online services in asymptomatic populations will affect STI diagnoses and transmission rates, if time to treatment is affected adversely.

References

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