APTIMA® Combo 2 Testing Detects Additional Cases of *N. gonorrhoeae* in Community Settings

J. Kapala[1], K. Biers[1], M. Cox[1], M. Kamionka[1], J. Sumner[1], D. Jang[2], M. Chernesky[2]

[1]Gamma-Dynacare Medical Laboratories, Brampton, ON, [2]St. Joseph's Healthcare, Hamilton, ON, CANADA

REVISED ABSTRACT

Objectives: Lower genital tract infections with *Neisseria gonorrhoeae* [GC] may be asymptomatic and accompanied with *Chlamydia trachomatis* [CT]. Attempts to culture GC from clinical samples can be unsuccessful. A commercial transcription mediated amplification [TMA] assay, APTIMA Combo 2 [AC2], is available for the detection of CT and GC RNA in clinical specimens and positives can be confirmed in alternate individual TMA tests [ACT and AGC]. We evaluated the utility of performing AC2 testing for GC on specimens submitted for GC culture or CT TMA.

Methods: From March to August 2008, a total of 81,405 samples from men and women attending doctors' offices, in Ontario, were inoculated onto modified Thayer-Martin medium and a second sample collected for TMA was tested for GC RNA by AC2 [Gen-Probe Inc.] by direct tube sampling [DTS 1600] or on the TIGRIS instrument [group A]. A second group of swabs [n = 14,666] which had no GC culture ordered but were submitted for CT testing in AC2 were tested for GC RNA [group B]. A proportion of AC2-GC positive samples with sufficient volume [n=65] were retrieved and retested by AGC [confirmatory testing].

Results: The GC prevalence rate by culture was 0.2% [6.0% men / 0.09% women]. Ninety-nine percent of the samples were from women. The AC2 test for GC in group A detected all culture positives and 67 additional positives from the culture-negative group, increasing the prevalence rate to 0.25. Seventy-five AC2-GC positives were found in group B. Confirmatory testing of representative samples from Groups A and B with AGC found 98.5% [64/65] positive.

Conclusion: Sixty-seven extra cases of *N. gonorrhoeae* infections were diagnosed by AC2 testing samples submitted for culture. GC positives were also found in 75 (0.5 %) of samples submitted for AC2 CT testing without an order for GC. 64 of 65 samples (98.5%) retested by an AGC test confirmed positive. AC2 testing enabled identification and treatment of 142 cases of gonorrhea which would have been reported negative or would not have been investigated.

BACKGROUND

Lower genital tract infections with *Neisseria gonorrhoeae* [GC] may be asymptomatic and are often accompanied with *Chlamydia trachomatis* [CT]. Urogenital asymptomatic gonoccocal infections in women are estimated to range from 25 to 80% (1).

Testing for GC in most Community Laboratories is presently performed by culture. Some of these laboratories possess the ability to test for GC with nucleic acid amplification tests [NAATs]. Culture is carried out in order to obtain antimicrobial susceptibility information on GC isolates (2). Attempts to culture GC from clinical samples are often unsuccessful. Isolation is affected by time elapsed from specimen collection to swab innoculation (3). NAAT methods targeting gonoccocal nucleic acid do not depend on the presence of viable organisms. A commercial transcription mediated amplification [TMA] assay, APTIMA Combo 2 [AC2], is available for the simultaneous detection of CT and GC RNA in clinical specimens and positives can be confirmed in alternate individual TMA tests [ACT and AGC].

OBJECTIVES

1. To collect a second sample for GC testing by AC2 from patients being investigated for GC by culture.
2. To perform GC testing by AC2 on samples submitted for CT testing.
3. To confirm AC2-GC positives using AGC assay.

METHODS

Patient recruitment: From March to August 2008, 96,071 urogenital samples from men and women attending doctor's offices in the GTA submitted samples for CT and GC testing, or CT only.

Group A: physician-collected APTIMA STM or urine and swab (M40 Transystem, Copan) for GC culture (81,405 patients)

Group B: physician-collected APTIMA STM (requesting CT testing ONLY) or urine (14,667 patients)

Laboratory specimen handling/testing:

- GC culture plates [Modified Thayer-Martin/ non-selective chocolate agar, PML Microbiological]
- GC culture confirmation: VITEK NHI test card and Gonogen serological test
- AC2-GC on the TIGRIS or the DTS 1600 system
- Confirmatory testing with AGC

RESULTS

Figure 1. Algorithm of testing shows 142 extra cases of GC.

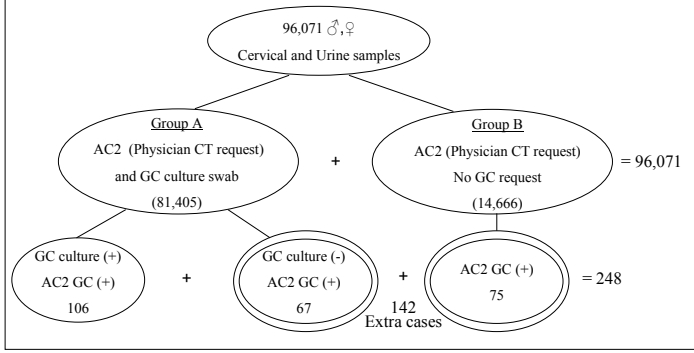


Figure 2. The 248 GC positives were distributed in swabs and urines from men and women.

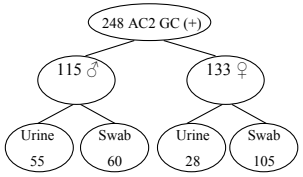
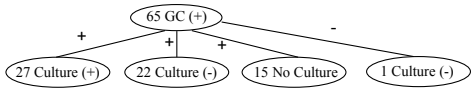


Figure 3. Using the AGC assay against a different target, 98.5% (64/65) of samples confirmed.



CONCLUSIONS

1. The GC prevalence rate by culture was 0.2 [6.0% men / 0.09% women].
2. The AC2 test for GC in group A detected all culture positives and 67 additional positives from the culture-negative group. This increased the prevalence rate to 0.25.
3. GC culture missed 38.7% [67/173] of the APTIMA GC positives.
4. A subset of APTIMA GC positives demonstrated a confirmation rate of 98.5% [64/65].
5. Testing samples submitted only for CT, identified 75 extra GC positives.
6. 142 extra cases were treated for GC

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