247. Agar Gradient Diffusion Susceptibility Testing for *Neisseria gonorrhoeae:* A Reliable Alternative to Agar Dilution?

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Session: 46. Clinical: Sexually Transmitted Infections
Thursday, October 5, 2017: 12:30 PM

Background. Antimicrobial susceptibility testing by agar dilution, the gold-standard for determination of minimal inhibitory concentration (MIC) for *N. gonorrhoeae*, is a labor intensive technique usually performed in reference laboratories. Agar gradient diffusion is a simpler alternative to obtain MICs. However, correlation of *N. gonorrhoeae* MIC values obtained by the two methods is not well established. The objective of this study is to evaluate performance of agar gradient diffusion compared with agar dilution for *N. gonorrhoeae*.

Methods. Fifty strains of *N. gonorrhoeae* (34 isolates from clinical specimens; 14 WHO reference and two ATCC strains), all confirmed to be genetically distinct using molecular typing (NG-MAST), were selected. Isolates with known high MICs were targeted. Agar gradient diffusion MIC testing was done in a clinical laboratory on all strains for ceftriaxone, cefixime, and azithromycin while comparing two different commercial antimicrobial strips (bioMérieux, Alere) on three different culture media (BD, Oxoid, CLSI's recommended medium). Agar dilution MIC testing according to CLSI was done at the Québec provincial reference laboratory on all strains. Performance of agar gradient diffusion was assessed by accuracy, using essential and categorical agreements, and by precision (reproducibility).

Results. When comparing agar dilution and agar gradient diffusion using bioMérieux strips on CLSI testing medium, essential agreements (within 1-log2 dilution) were 94, 88, and 82% for ceftriaxone, cefixime, and azithromycin, respectively. Categorical agreements were 100, 94, and 94%. Agar gradient diffusion, compared with agar dilution, had a tendency to under-estimate MIC for third-generation cephalosporins, not classifying 86% of isolates with decreased susceptibility (MIC 0.12–0.25 mg/l for ceftriaxone, 0.25 mg/l for cefixime) as such. Overall precision of agar gradient diffusion was 96%.

Conclusion. Agar gradient diffusion using bioMérieux strips on CLSI testing medium shows satisfactory accuracy compared with agar dilution for *N. gonorrhoeae* MIC testing of third-generation cephalosporins and azithromycin even in a carefully selected panel of strains.

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Oxoid: Research Contractor, Research support

248. High Correlation of Visual Inspection and a Smartphone-Based Electronic Reader of Two Dual Rapid Diagnostic HIV/Syphilis Assays

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Session: 46. Clinical: Sexually Transmitted Infections
Thursday, October 5, 2017: 12:30 PM

Background. The HRDR-200 automated reader (Cellmic, LLC, CA, USA) is an opto-mechanical smartphone attachment that reads lateral flow-based rapid HIV/Syphilis combo assays. The reader may minimize human errors in interpreting rapid tests as well as provide a centralized data system for epidemiologic monitoring.

Methods. We enrolled men who have sex with men and transgender women >18 years old seeking services at a sexually transmitted disease clinic in Lima between October 2016 and April 2017. Venous blood was tested using two dual HIV and Syphilis rapid tests (SD BIOLINE HIV/Syphilis Duo (SD), Republic of Korea; and First Response HIV 1 + 2/Syphilis Combo (FR), India). HIV infection was confirmed with fourth-generation EIA tests, while Syphilis was confirmed with RPR, TPPA, and TPHA titers. Clinic staff visually inspected rapid tests, after which the tests were read by the HRDR-200. To assess how well the reader results correlated with visual inspection we calculated negative and positive percent agreement, concordance, and kappa statistic.

Results. Of 283 participants, 34% were HIV-infected and 46% had treponemal antibodies (69% of whom had reactive RPR titers). The concordance of reader results with visual inspection was high for both antibodies and both rapid assays (see Table).

Syphilis Antibody		Test Positive	Test Negative	% Positive Agreement (95% CI)	% Negative Agreement (95% CI)	Concordance	Kappa Statistic
FR	Reader	99	184	98.9 (94.5–99.9)	96.1 (92.3–98.4)	0.97 (0.95–0.99)	0.94 (0.89–0.98)
	Operator	105	178	93.3 (86.7–97.2)	99.4 (96.9–99.9)		
SD	Reader	98	185	98.9 (94.4–99.9)	95.6 (91.6–98.1)	0.97 (0.94–0.99)	0.93 (0.89–0.98)
	Operator	105	178	92.3 (85.5–96.6)	99.4 (96.9–99.9)		
HIV Antibody							
FR	Reader	89	194	98.8 (93.8–99.9)	95.8 (92.0–98.2)	0.97 (0.94–0.99)	0.93 (0.88–0.97)
	Operator	96	187	91.6 (84.2–96.3)	99.4 (97.0–99.9)		
SD	Reader	97	186	98.9 (94.3–99.9)	100 (98.0–100)	0.99 (0.98–0.99)	0.99 (0.98–1.00)
	Operator	96	187	100 (96.2–100)	99.4 (97.0–99.9)		

Conclusion. Given the high correlation of the reader with visual inspection, further investigation is warranted into the potential utility of the reader for epidemiologic monitoring as well as for improving HIV and Syphilis diagnosis in areas without technicians trained in visual inspection of rapid tests.

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249. Use of Oral Fluid in a Rapid Syphilis Test Assay

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Session: 46. Clinical: Sexually Transmitted Infections
Thursday, October 5, 2017: 12:30 PM

Background. From 2014 to 2015, the syphilis rate in the United States increased by 19%, reaching its highest rate since 1994. Currently, point-of-care syphilis assays use fingerstick or venipuncture whole blood to identify *Treponema pallidum* (TP) antibodies by qualitative immunoassay. However, patients and providers prefer oral fluid testing to whole blood testing. In this study, we aimed to determine whether a rapid syphilis test intended for use on whole blood could be used to detect TP antibodies in oral fluid.

Methods. Oral fluid was collected from 72 participants using the Super•SAL™ Oral Fluid Collection Device (Oasis Diagnostics®, Vancouver, WA). The device uses an absorbent cylindrical pad to collect and filter ~1 mlml of oral fluid. Oral fluid filtrate was tested using the SD Bioline Syphilis 3.0 rapid test (Alere Diagnostics, MA) following manufacturer directions for whole blood. TP particle agglutination (TPPA) and rapid plasma reagin (RPR) results derived from participants' medical records were