Culture yield of *Neisseria gonorrhoeae*; influence of culture sampling site and timing.

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Background:
Neisseria gonorrhoeae (NG) is one of the World Health Organization's high-priority bacterial pathogens due to the emergence of multidrug-resistant strains. Nucleic acid amplification tests (NAAT) have been widely used for NG detection, given their high sensitivity. However, the culture of NG remains important for providing antimicrobial resistance surveillance data.

Methods:
We analysed de-identified data of positive NG NAAT specimens of individuals attending the Melbourne Sexual Health Centre between April 2015 and March 2023. To determine the NG culture yield following a positive NG NAAT, we calculated the NG culture yield within 30 days and stratified by culture specimen collection sites and culture time intervals.

Results:
The NG culture yield was lowest in pharynx (37.9%, 95% confidence interval [CI] 36.6% to 39.2%, 1,964/5,185) followed by vagina (41.6%, 95% CI 37.0% to 46.3%, 186/447), cervix (60.1%, 95% CI 52.2% to 67.7%, 98/163) and rectum (68.0%, 95% CI 66.6% to 69.3%, 3,223/4,742) and urethra (97.0%, 95% CI 96.4 to 97.6, 3,282/3,382). The overall NG culture yield was 77.8% (95% CI: 76.8% to 78.8%, 5,254/6,754) when the culture was performed on the same date as the NAAT test, and it decreased to 53.6% (95% CI: 51.5% to 55.7%, 1,193/2,224) 1 to 3 days, then to 37.1% (95% CI: 30.7% to 43.7, 83/224) 15 to 30 days after the NAAT positive specimens (p_{trend}<0.001).

Conclusion:

The sample sites and the timing of culture collection influenced the culture yield. The lower culture yield from the pharynx and vagina limits the availability of antimicrobial resistance surveillance data for these sites. To optimise culture yield, NG culture should be performed as close as possible to the initial NG NAAT diagnostic testing. Additionally, further development of metagenomic testing methods is needed to enhance surveillance beyond reliance on cultures.

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