



Evaluation of Sigma Transwab® in Liquid Amies Transport Medium for *Neisseria gonorrhoeae* Culture.

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Introduction

Direct inoculation of LCAT (Lincomycin, Colistin sulphate, Amphotericin B, Trimethoprim) agar plates has been considered technically superior for recovery of *Neisseria gonorrhoeae* in clinical specimens. However, there are numerous disadvantages that make this procedure increasingly less attractive in a busy, cost-driven, clinical environment. Direct inoculation requires parameters which the laboratories are unable to strictly control such as : agar plates have to be purchased, transported to, refrigerated, and kept in-date at Sexual Health Clinics. Due to the large geographical area served by NHS Fife, culture plates inoculated in the Sexual Health Clinics are often delayed in transit to the laboratory which in turn has an impact on the recovery of *Neisseria gonorrhoeae*. The introduction of Sigma Transwab® (manufactured and distributed by Medical Wire) was evaluated as a method of improving specimen quality in these circumstances.

Aim

To determine whether the use of foam-tipped swabs in liquid Amies transport medium would result in comparable recovery of *Neisseria gonorrhoeae* with direct near patient inoculation of specimens to LCAT culture plates.

Materials

Based on published recovery rate data, literature reviews and user preference, the Sigma Transwab® was selected for the evaluation.

- MW177S Mini tip swab, orange capped, for urethral sampling.
- MW176S Standard tipped swab, purple capped, for cervical, rectal, throat and eye sampling.
- LCAT (Lincomycin, Colistin sulphate, Amphotericin B, Trimethoprim)-Thermofisher product no: PB0226A).

Methods

The Sigma Transwabs® were obtained in parallel with the direct culture on LCAT plates in three Sexual health clinics over a 7 month period. Patients were informed that the trial swabs would be obtained. If the patient declined the request this was noted in the clinical notes, “patient declined trial swab”.

Procedure for direct culture to LCAT agar plates

- 10µl disposable loops for urethral sampling were used to prepare a smear slide and inoculate a single LCAT culture plate.
- Urine sample was obtained for NAAT (Nucleic Acid Amplification Test - Roche) for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* PCR testing.
- For all other anatomical sites (cervical, throat, rectal and eye) the NAAT sample was collected, followed by inoculation of a single LCAT culture plate using a dry cotton swab for each site.

Procedure for Sigma Transwab® sample collection

- Male urethral sampling - the Sigma Transwab® was obtained before the urine sample for NAAT. The swab was rolled over visible discharge or inserted into but not beyond the terminal 2 cm of the urethra.
- For all other sites the Sigma Transwab® was obtained after all other samples for NAAT and direct culture plate inoculation had taken place.

On receipt in the laboratory the Sigma Transwab® were inoculated on to individual LCAT plates and stroked out for single colonies. The direct culture plates and the Sigma Transwab® cultured plates were then incubated in parallel at 35 +/-2 °C in an atmosphere of 5% CO2 for up to 48 hours.

Culture plates were examined at 24 & 48 hours and bacteria presumptively identified on the basis of colony morphology, oxidase (positive), Gram stain (Gram negative diplococci), and confirmed by biochemical reactions using API® NH Biomerieux (Product Code:10 400) (Acceptable profile 1000 & 1001) and Reference laboratory confirmation by Scottish Bacterial Sexually Transmitted Infections Reference Laboratory, NRIE, Edinburgh.

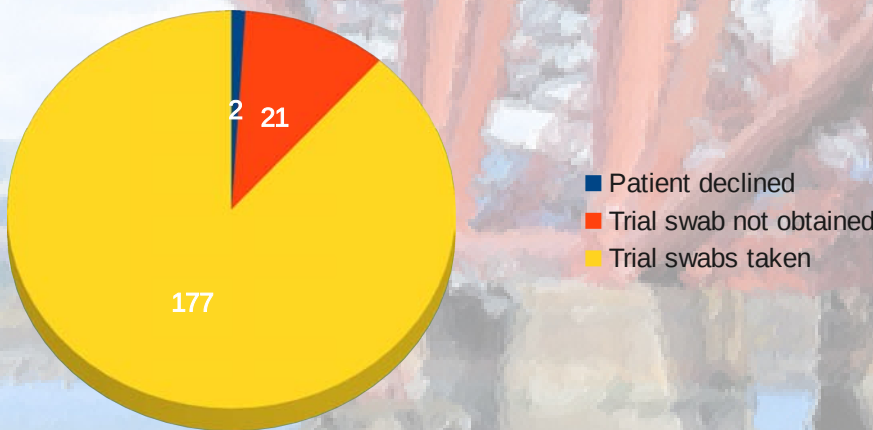
Results

Specimen number	Specimen type	Direct culture		Trial Swab Culture	
		24 hrs	48 hrs	24 hrs	48 hrs
1	URETHRAL	NEG	POS	POS	--
2	URETHRAL	NEG	POS	NEG	POS
3	URETHRAL	NEG	POS	NEG	POS
4	URETHRAL	NEG	POS	POS	--
5	URETHRAL	NEG	POS	POS	--
6	URETHRAL	NEG	NEG	POS	--
7	URETHRAL	NEG	POS	POS	--
8	URETHRAL	NEG	NEG	POS	--
9	URETHRAL	NEG	POS	NEG	POS
10	URETHRAL	NEG	POS	NEG	POS
11	URETHRAL	NEG	POS	NEG	POS
12	URETHRAL	NEG	POS	NEG	POS
13	THROAT	NEG	POS	NEG	POS
14	URETHRAL	NEG	POS	NEG	POS

Direct culture/ Trial swab POS: *Neisseria gonorrhoeae* isolated
Direct culture/ Trial swab NEG: *Neisseria gonorrhoeae* NOT isolated

Patient Compliance

Of a possible 200 samples, 177 trial swabs were obtained from the 3 selected trial sites. Confirmed *Neisseria gonorrhoeae* was isolated from 14 samples.



Discussion

The use of Sigma Transwab® in liquid Amies transport medium obtained in parallel with the current LCAT culture plates has provided data which demonstrates an increase in recovery of the target thereby contributing to a service improvement.

Growth of *Neisseria gonorrhoeae* was achieved in a total of 14 samples obtained from the Sigma Transwab® plates, while only 12 positive cultures were isolated from the direct culture plates, a 14% increase in recovery capability. Growth was achieved from the Sigma Transwab® plates at 24 hours, in 6 cases, whereas all of the direct culture plates were incubated for a further 24 hours. The results indicate not only a more rapid identification, but also a more accurate method of diagnosis. This is demonstrated in the 2 cases where *Neisseria gonorrhoea* was only detected when using Sigma Transwab®. The current method of direct inoculation would have produced false negative results in these cases.

Delays in incubation of direct culture plates along with use of media below optimum conditions undoubtedly contribute to the failures of the current system. Management of Sigma Transwab® stock is easier than culture plates as they can be stored at room temperature and have a shelf life of 2 years.

The Sigma Transwab® inoculated plates were stroked out for single colonies which in some cases made the performance of further identification possible at 24 instead of 48 hours. This is particularly evident in rectal and throat swab cultures where mixed cultures are common.

Conclusions

The use of Sigma Transwab® in liquid Amies transport medium provides a superior recovery method for *Neisseria gonorrhoeae* from clinical material which is not only a quality improvement but also a service improvement for the patient, allowing for a more efficient management of the process.

The outcome of this study was a change in procedure at all Sexual health clinics. NHS Fife adopted the use of Sigma Transwab® in liquid Amies transport medium to obtain the relevant anatomical samples for transportation to the Microbiology laboratory for culture and identification of *Neisseria gonorrhoeae*.

Acknowledgements and References

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