Evaluating the effectiveness of gram stain microscopy in identifying gram negative intracellular diplococci suggestive of *Neisseria Gonorrhoea*

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Introduction

Gram stain microscopy is an effective tool in the management of gonorrhoea in symptomatic patients, allowing for the visual identification of suspicious bacteria, which when also considering the history and risk, can be indicative of a current gonorrhoea infection allowing for rapid treatment and partner notification initiation. This is an on-going audit to verify the effectiveness of in-house diagnostics.

Background

Microscopy of Gram-stained genital specimens allows direct visualization of *N. gonorrhoeae* as monomorphic Gram-negative diplococci within polymorphnuclear leukocytes. It offers good sensitivity (90–95%) in men with urethral discharge and is recommended to facilitate immediate diagnosis in symptomatic men (BASHH 2011). In women, microscopy has poor sensitivity for the identification of gonococcal infection: 37–50% for endocervical smears (BASHH 2011). These are the standards we compare our local results against. Gonorrhoea is an infection that has shown an increase in recent years, and evidence has shown an increase of antibiotic resistant gonorrhoea infections. Same day diagnosis allows for immediate treatment, and preventing spread of the infection further.

Methods

Utilising the pathology results system, positive culture results for gonorrhoea were collected each week to ascertain if presumptive gonorrhoea had been diagnosed at attendance as well as the presence of symptoms, contact status and vaginal flora grade (in women). The positive culture results were matched along side the laboratory logbook for identified on microscopy. If no results match the logbook the patients clinical notes were reviewed to establish if microscopy was undertaken. If the microscopy was negative in the notes, the slide was also reviewed. If the microscopy was found to be positive on review, this was fed back to staff members.

Results

Data from July 2016- January 2017:

Male urethral samples: 147/157 (93.6%) infections were correctly identified, when asymptomatic contacts were excluded 147/154 (95.5%) were identified. Of those infections not identified on microscopy on the day, 4 were negative on review.

Female cervical samples: 5/20 (25%) infections were correctly identified on microscopy, when asymptomatic contacts were excluded 5/19 (26.3%) were identified. Of those not identified on microscopy the day, 9 slides were negative on review.

	Total diagnosed on the day		Excluding asymptomatic contacts		Excluding negative on slide review	
	Urethral	Cervix	Urethral	Cervix	Urethra	Cervix
August	91.7% (33/36)	0 (0/4)	91.7% (33/36)	0 (0/4)	97.1% (33/34)	50% (1/2)
September	96% (25/26)	25% (1/4)	96% (25/26)	25% (1/4)	100% (25/25)	100% (1/1)
October	93% (27/29)	100% (1/1)	93% (27/29)	100% (1/1)	93% (27/29)	100% (1/1)
November	100% (24/24)	25% (1/4)	100% (24/24)	25% (1/4)	100% (24/24)	50% (1/2)
December	84% (16/19)	20% (1/5)	94% (16/17)	25% (1/4)	100% (16/16)	33% (1/3)
January	100% (26/26)	50% (2/4)	100% (26/26)	50% (2/4)	100% (26/26)	66% (2/3)
Overall	94% (151/160)	27% (6/22)	96% (151/158)	29% (6/21)	98% (151/154)	58% (7/12)

	Jan-June 2016		August 2016-January 2017					
	Raw data only		standard		Enhanced with asymptomatic contact excluded		Enhanced with negative on review or unable to review excluded	
	%	Number	%	No	%	No	%	No
Male	83	112/135	94%	151/160	96	151/158	98	151/154
Female	20	9/46	27%	6/22	29	6/21	58	7/12

Discussion

Microscopy identified 95.5% of symptomatic male urethral infections and 26.3% of female cervical samples. There was also a low 'failure' rate, of the 24 slides reviewed on 7 were positive, therefore 'true missed' on day diagnoses. Effective on day diagnosis can prevent further transmission, allow faster access to treatment and allow for prompt partner notification. In addition, is a rewarding skill for the clinical staff. Moving forward, the continued auditing with enhanced data collection, weekly feedback to staff and yearly re-assessment is anticipated to improve practice. Furthermore, although there is not set standard to measure against, the audit is going to be expanded to include rectal samples, it would be beneficial to identify good and bad practice.

References

BASHH (2011) UK national guideline for the management of gonorrhoea in adults, 2011. Accessed (04.06.17): <https://www.bashhguidelines.org/media/1044/gc-2011.pdf>
Public Health England (2015) Sexually Transmitted Infections in England, 2015. Accessed (04.06.17): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/535085/England_STI_Slide_Set_2015.pdf