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Establishing a protocol for the handling of *Neisseria gonorrhoeae* at Nottingham Trent University, and observations of antibiotic susceptibility

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Neisseria gonorrhoeae is the etiological agent of gonorrhoea, a prevalent sexually transmitted disease (STI), which is rapidly becoming untreatable. *N. gonorrhoeae* is fastidious, and samples become less viable during transport and cultivation, often causing false-negative diagnosis. In this study: Growth, identification, viability and antibiotic susceptibility of *N. gonorrhoeae* were investigated. Various agar and broth media were modified to suit the nutritional requirements of the gonococcal isolate under different environmental conditions. Antibiotic disc diffusion was completed to observe the interaction between *N. gonorrhoeae* and antibiotics: Penicillin, Doxycycline and Ceftriaxone.

Results: *N. gonorrhoeae* grew successfully on chocolate (CHOC) agar and modified Thayer-Martin agar (mTM). Limited growth occurred on modified Iso-Sensitest agar (mISA), whilst Brain heart infusion (BHI) broth and agar

contained no gonococcal growth. *N. gonorrhoeae* showed susceptibility to penicillin concentrations 0.1unit/disc – 1unit/disc and resistance to 30µ/disc ceftriaxone. However, when used simultaneously, large key-hole shaped zones of inhibition surrounded both doxycycline and ceftriaxone.

Conclusion: Growth of *N. gonorrhoeae* *in vitro* is possible on selective (CHOC) and non-selective (mTM) agar containing lysed defibrinated horse blood, under strict growth conditions. The viability of isolates was longer than suggested in literature, however sub-culture of samples is recommended every 48 hours. Isolation of *N. gonorrhoeae* using traditional culture methods is unpredictable and research into rapid testing is required. *N. gonorrhoeae* susceptibility varies between strains however the pathogen is rapidly becoming untreatable and novel therapeutics or alternative prevention methods are required.

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