

P3.282 MULTI-ANTIGEN SEQUENCE TYPES (NG-MAST) AND ANTIMICROBIAL SUSCEPTIBILITIES ON NEISSERIA GONORRHOEAE ISOLATED IN CANADA, 2010–2011

doi:10.1136/sextrans-2013-051184.0738

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Background *Neisseria gonorrhoeae* have acquired resistance to many antibiotics and have developed decreasing susceptibilities to 3rd generation cephalosporins.

Method NG-MAST sequence types and minimum inhibitory concentration (MICs) by agar dilution were determined for each *N. gonorrhoeae* isolate collected by Canadian provincial public health laboratories and submitted to the National Microbiology Laboratory between 2010–2011 (N = 2391). Isolates are submitted to the NML only when the provincial laboratories identify resistance to at least one antibiotic or if the provincial laboratories do not conduct any antimicrobial susceptibility testing. MIC interpretations were based on the criteria of the Clinical Laboratory Standards Institute (CLSI) and the World Health Organization (WHO) criteria for decreased susceptibility to cephalosporins.

Results Among all the isolates tested in Canada during 2010–2011, 23.5% (1489/6330) were resistant to penicillin, 31.8% (2014/6330) to tetracycline, 28.9% (1828/6330) to erythromycin, 32.4% (2051/6330) to ciprofloxacin and 0.8% (50/6330) to azithromycin. Based on the WHO guidelines for decreased susceptibility to cefixime MIC ≥ 0.25 mg/L and decreased susceptibility to ceftriaxone MIC ≥ 0.125 mg/L, 3.3% (98/2970) of isolates had decreased susceptibility to cefixime in 2010. This number rose to 4.2% (140/3360) in 2011. Ceftriaxone MICs decreased slightly from 7.2% (218/2970) of isolates with decreased susceptibility in 2010 to 6.2% (208/3360) isolates with decreased susceptibility in 2011. In 2010, 249 STs were identified: the most common STs were ST1407, ST3150 and ST3158 at 13.3%, 11.3% and 9.0% respectively. In 2011, 238 STs were identified: the most common STs were ST1407, ST3307 and ST3550 at 15.3%, 9.3% and 5.9% respectively.

Conclusions Detecting changing antibiotic susceptibilities of *N. gonorrhoeae* isolates in Canada has resulted in the modification of treatment guidelines. Canada's most prevalent NG-MAST type, ST1407 is internationally reported and is of particular interest as it is responsible for cefixime and ceftriaxone treatment failures.

P3.283 TRENDS AND ASSOCIATIONS OF NEISSERIA GONORRHOEAE INFECTION IN MEN AND WOMEN WITH GENITAL DISCHARGE SYNDROMES IN JOHANNESBURG, SOUTH AFRICA

doi:10.1136/sextrans-2013-051184.0739

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Background Annual STI aetiological surveys undertaken at a primary healthcare facility in Johannesburg, South Africa, each year have determined the prevalence of gonorrhoea amongst men with male urethral discharge syndrome (MUDS) and women with vaginal discharge syndrome (VDS). We investigated associations between *Neisseria gonorrhoeae* infection and the demographic, clinical, microbiological and behavioural characteristics of these patients.

Methods During six annual surveys (2007–2012), 1,218 MUDS and 1,232 VDS cases were consecutively recruited. Aetiology was determined using nucleic acid amplification assays (*N. gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, *Mycoplasma genitalium*), microscopy of vaginal smears (bacterial vaginosis, *Candida*) and serology (syphilis, HSV-2, HIV). Chi-squared tests and logistic regression analyses were used to identify predictors of *N. gonorrhoeae* infection.

Results There were no significant trends in the prevalence of gonorrhoea among MUDS and VDS patients. Overall, 908 (74.6%) men and 156 (12.7%) women were *N. gonorrhoeae* positive, with the highest prevalence observed in men aged 30–34 years (79.1%) and women aged 18–19 years (19.2%). *N. gonorrhoeae* was detected more often in MUDS patients co-infected with HIV (aOR 2.25, 95% CI, 1.59–3.17) but less often among men with co-existent *C. trachomatis* (aOR 0.36, 95% CI 0.26–0.49), *T. vaginalis* (aOR 0.29, 95% CI 0.17–0.50) and *M. genitalium* infection (aOR 0.15, 95% CI 0.10–0.22). In contrast, the presence of *N. gonorrhoeae* infection in women with VDS was higher in younger women (aOR 0.72, 95% CI 0.63–0.83) and women co-infected with *C. trachomatis* (aOR 2.23, 95% CI 1.50–3.31).

Conclusion We have demonstrated an important association between gonococcal urethral discharge and HIV co-infection in men, which emphasises the importance of early diagnosis, treatment and prevention of gonorrhoea as a strategy to reduce HIV transmission to serodiscordant partners. Our data also emphasise the fact that VDS patients with gonorrhoea are also at high risk of having co-existent chlamydial infection.

P3.284 FACTORS ASSOCIATED WITH VARIATIONS IN CULTURE CONFIRMATION FOR NEISSERIA GONORRHOEA: A STUDY OF PATIENTS ATTENDING FIVE GENITOURINARY MEDICINE CLINICS IN ENGLAND

doi:10.1136/sextrans-2013-051184.0740

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Background Screening for gonorrhoea at genitourinary medicine (GUM) clinics in England is routinely performed using Nucleic Acid Amplification Tests (NAATs), but confirmation of NAAT-positive specimens by culture is required to monitor trends in antimicrobial resistance for *Neisseria gonorrhoeae*. We determined the proportion of patients whose gonorrhoea diagnoses were confirmed by culture and investigated whether they differed from those that were only screened by NAATs.

Methods All NAAT-positive attendees reported to the GUM Clinic Activity Dataset (GUMCAD, a mandatory STI surveillance system among GUM clinics in England) from 5 clinics included in the Gonococcal Resistance to Antimicrobial Surveillance Programme (GRASP) from July–September 2011 were included in this analysis. Data from both datasets were linked by patient episode; all NAAT-positive attendees that were matched to a record in GRASP were considered culture-confirmed. Patient characteristics that were significant on Pearson's chi-square were included in an age- and clinic-adjusted logistic regression model to determine adjusted odds ratios (aORs) for being culture-confirmed.

Results Among all 844 NAAT-positive attendees, 54% were culture-confirmed. Most attendees were between the ages of 15–34 years (70%), white (55%), and 52% of those who gave information on sexual orientation were men who had sex with men (MSM); 72% of symptomatic attendees were culture-confirmed ($p < 0.001$). Females and MSM were less likely than heterosexual males to be culture-confirmed [aOR(95% CI): 0.51(0.31–0.85), $p = 0.010$; and

0.49(0.30–0.80), $p = 0.004$, respectively], while those with a concurrent STI [1.69(1.15–2.49), $p = 0.007$], and those presenting with multiple infection sites [2.54(1.62–4.00), $p < 0.001$] were more likely to be culture-confirmed.

Conclusion Not all NAAT-positive attendees were culture-confirmed, but this may be because culture was either unsuccessful or not routinely performed among asymptomatic attendees. All NAAT-positive patients should be cultured before treatment, as routine culture confirmation is essential to ensure representative monitoring of trends in antimicrobial resistance to inform decisions regarding treatment guidelines for gonorrhoea.

P3.285 **DIAGNOSTIC AND TREATMENT UNCERTAINTIES: EPIDEMIOLOGICAL RISK FACTORS FOR NAAT POSITIVE BUT CULTURE NEGATIVE GONORRHOEA CASES IN STOCKHOLM, SWEDEN**

doi:10.1136/sextrans-2013-051184.0741

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Background The advent of gene amplification testing methods for *Neisseria gonorrhoea* has led to a higher prevalence of gonorrhoea testing in the population. Various methods for Nucleic Acid Amplification Tests (NAAT) are used, often with high specificity. The sensitivity of culture is substantially lower than NAAT. Before treatment is initiated, antibiotic sensitivity of the isolate should be determined using culture-based methods. A considerable proportion of cases positive with NAAT cannot be verified by culture and hence it is not possible to verify the diagnosis or determine antibiotic sensitivity. Uncertainty in diagnostics and treatment of NAAT positive, culture negative gonorrhoea may lead to psycho-social and physical complications and continued transmission. To improve diagnostic and treatment accuracy for gonorrhoea, the objective of this study was to examine epidemiological risk-factors for NAAT positive but culture negative cases.

Methods The study included all men and women in Stockholm having at least one positive gonorrhoea NAAT test with follow-up cultures taken during the period January 1, 2011–June 30, 2012. The total number of eligible cases during this period was 938. Data on sex, age, mode of transmission, symptoms, *Chlamydia trachomatis* co-infection and NAAT lab method were collected. Outcome was defined as positive NAAT but negative follow-up culture. Descriptive statistics and cross-tabulations with chi-squared tests were performed.

Results In total, 19% of NAAT positive cases had no positive cultures ($N = 174$). Diagnostic certainty was greater among men than women. Ten-percent of men and 37% of women with positive NAAT had negative cultures. Three laboratory NAAT methods were used with differences in subsequent negative culture proportions found among these methods.

Conclusion Women have an increased risk for incorrect diagnosis and/or treatment of gonorrhoea. Improved gonorrhoea testing practices are necessary to avoid systematic misdiagnoses and inappropriate treatments.

P3.286 **WITHDRAWN BY AUTHOR**

P3.287 **COMPARISON OF ANTIMICROBIAL SUSCEPTIBILITY OF NEISSERIA GONORRHOEA ISOLATES OBTAINED FROM THE PHARYNX, RECTUM AND URETHRA IN MEN WHO HAVE SEX WITH MEN**

doi:10.1136/sextrans-2013-051184.0742

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Background The emergence of cephalosporin resistance in *Neisseria gonorrhoeae* threatens gonorrhoea control programmes worldwide. Data on gonococcal antimicrobial susceptibility in the United States come from the Gonococcal Isolate Surveillance Project, which monitors susceptibility in male urethral isolates. Little is known about the susceptibility of isolates obtained from extra-genital sites. We sought to describe and compare antimicrobial susceptibility patterns of pharyngeal, rectal, and urethral gonococcal isolates obtained from men who have sex with men (MSM) at selected sentinel surveillance sites.

Methods We assessed the antimicrobial susceptibility of pharyngeal, rectal, and urethral gonococcal isolates collected from MSM at five sexually transmitted disease clinics throughout the United States. Minimum inhibitory concentrations (MICs) were determined by agar dilution at two regional laboratories, and elevated MICs were confirmed at the Centers for Disease Control and Prevention.

Results During December 2011–August 2012, a total of 85 pharyngeal, 99 rectal, and 315 urethral isolates from MSM were submitted. The proportion of isolates with an elevated cephalosporin or azithromycin MIC did not significantly differ by anatomic site: 1.2% of pharyngeal, 3.0% of rectal, and 3.2% of urethral isolates had an elevated cefixime MIC ($\geq 0.25 \mu\text{g/mL}$) ($p = 0.79$); 5.9% of pharyngeal, 7.1% of rectal, and 8.3% of urethral isolates had an elevated cefpodoxime MIC ($\geq 0.25 \mu\text{g/mL}$) ($p = 0.86$); 1.2% of pharyngeal, 2.0% of rectal, and 4.1% of urethral isolates had an elevated ceftriaxone MIC ($\geq 0.125 \mu\text{g/mL}$) ($p = 0.47$); and 2.4% of pharyngeal, 1.0% of rectal, and 1.6% of urethral isolates had an elevated azithromycin MIC ($\geq 2.0 \mu\text{g/mL}$) ($p = 0.91$).

Conclusion Among MSM, the proportion of urethral isolates with an elevated cephalosporin or azithromycin MIC was similar to that of pharyngeal and rectal isolates. These findings suggest that, at the population level, gonococcal antimicrobial susceptibility surveillance based on urethral isolates from MSM adequately represents antimicrobial susceptibility of *N. gonorrhoeae* circulating among MSM.

P3.288 **ANTIMICROBIAL SUSCEPTIBILITY AND MOLECULAR EPIDEMIOLOGIC CLUSTERS OF NEISSERIA GONORRHOEA STRAINS IN 2007 AND 2012 IN NANJING, CHINA**

doi:10.1136/sextrans-2013-051184.0743

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Background Gonorrhoea is the most prevalent bacterial sexually transmitted infection globally. It is of grave concern that *Neisseria gonorrhoeae* has developed resistance to mainly all antimicrobials introduced for treatment. China is located in the WHO Western Pacific Region (WPR), where most gonococcal antimicrobial resistance (AMR) has originated. However, the information regarding AMR and particularly molecular epidemiology of *N. gonorrhoeae* strains in China is highly limited. This study investigated the AMR and molecular epidemiologic clusters of *N. gonorrhoeae* in 2007 and 2012 in Nanjing, China.

Methods A total of 204 and 82 *N. gonorrhoeae* isolates were collected in 2007 and 2012, respectively, in Nanjing, China. The