Neisseria gonorrhoeae, the causative agent of gonorrhea remains a global public health issue and is the second most commonly reported bacterial sexually transmitted infection in Canada with over 12,000 cases reported in 2012 (Public Health Agency of Canada, unpublished data). Canada conducts surveillance of antimicrobial resistabilities in N. gonorrhoeae isolates to support development of treatment guidelines. The Canadian STI Guidelines have been evolving; combination gonorrhoea therapy with 250 mg ceftriaxone intramuscularly and azithromycin by agar dilution (Martin et al, 2011; CLSI, 2013) were adopted as the gold standard for treatment of gonorrhea in 2012 and submitted to the National Microbiology Laboratory for testing. Neisseria gonorrhoeae multi-antigen sequence types (NG-MAST or STs) and minimum inhibitory concentrations (MICs) were determined for all isolates tested and their results were compared to established MICs. Currently there are no etioparams or genotype interpretation criteria for N. gonorrhoeae. Results: The MICs of ceftriaxone ranged from <0.016 mg/L to 0.125 mg/L, with a modal MIC of 0.032 mg/L. Isolates with decreased susceptibilities to ceftriaxone and cefixime had a modal MIC for etraperanem of 0.047 mg/L. The gentamicin MIC for these isolates remained the same. There were 120 different STs identified among the 378 isolates tested. ST1407 was found to have the highest prevalence (10.1% (n=38) with ST3158, ST3077, ST4709 and ST7986 following at 5.1% (n=19) each). The modal MICs for the ST1407 isolates were 0.032 mg/L for etraperanem and 3 mg/L for gentamicin.

Conclusions: Most MICs to gentamicin and etraperanem in a collection of diverse Canadian N. gonorrhoeae isolates are similar to those reported in other countries. Gentamicin is already used for gonorrhea treatment in other countries and may be a future option for treatment in combination with azithromycin in Canada. Etraperanem MICs remained low but are slightly elevated in the isolates with decreased susceptibilities to ceftriaxone and cefixime. Cefixime Decreased Susceptibility

Penicillin Resistance

Cefixime Decreased Susceptibility

Penicillin Resistance

INTRODUCTION

Neisseria gonorrhoeae, the causative agent of gonorrhea remains a global public health issue and is the second most commonly reported bacterial sexually transmitted infection in Canada with over 12,000 cases reported in 2012 (Public Health Agency of Canada, unpublished data). Canada conducts surveillance of antimicrobial resistibilities in N. gonorrhoeae isolates to support development of treatment guidelines. The Canadian STI Guidelines have been evolving; combination gonorrhoea therapy with 250 mg ceftriaxone intramuscularly and azithromycin by agar dilution (Martin et al, 2011; CLSI, 2013) were adopted as the gold standard for treatment of gonorrhea in 2012 and submitted to the National Microbiology Laboratory for testing. Neisseria gonorrhoeae multi-antigen sequence types (NG-MAST or STs) and minimum inhibitory concentrations (MICs) were determined for all isolates tested and their results were compared to established MICs. Currently there are no etioparams or genotype interpretation criteria for N. gonorrhoeae. Results: The MICs of ceftriaxone ranged from <0.016 mg/L to 0.125 mg/L, with a modal MIC of 0.032 mg/L. Isolates with decreased susceptibilities to ceftriaxone and cefixime had a modal MIC for etraperanem of 0.047 mg/L. The gentamicin MIC for these isolates remained the same. There were 120 different STs identified among the 378 isolates tested. ST1407 was found to have the highest prevalence (10.1% (n=38) with ST3158, ST3077, ST4709 and ST7986 following at 5.1% (n=19) each). The modal MICs for the ST1407 isolates were 0.032 mg/L for etraperanem and 3 mg/L for gentamicin.

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METHOD

Neisseria gonorrhoeae were collected by Canadian provincial public health laboratories in 2012 and submitted to the National Microbiology Laboratory for testing. Isolates that had previously been tested for minimum inhibitory concentrations (MICs) for penicillin, tetracycline, spectinomycin, erythromycin, cefotaxime, ceftriaxone, cefixime and azithromycin by agar dilution (Martin et al, 2011; CLSI, 2013) were also tested in the present study for the etraperanem and gentamicin MICs (n=378). Five reference cultures were also tested and their results were compared to established MICs. Currently there are no etioparams or genotype interpretation criteria for N. gonorrhoeae. MICs of other antibiotics were interpreted as recommended by CLSI (2013) except erythromycin (within 7 base pairs) to ST1407. Azithromycin (CDC, 2007) andceftriaxone and azithromycin (WHO, 2012). Each participant’s results were compared to the established MICs. Neisseria gonorrhoeae multi-antigen sequence types (NG-MAST or STs) were determined as previously described (Martin et al, 2004).