TITLE: ANTIMICROBIAL SUSCEPTIBILITY OF NEISSERIA GONORRHOEAE ISOLATED IN RIO DE JANEIRO IN 2018 AND 2019

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ABSTRACT:

Neisseria gonorrhoeae is the etiological agent of gonorrhea, a sexually transmitted disease. This microorganism is a global health concern because of its ability to acquire and develop antimicrobial resistance mechanisms. Ceftriaxone and azithromycin are considered last-resource drugs to treat gonorrhea. Although other classes of antimicrobial agents, such as carbapenems and aminoglycosides, have been successfully used to treat this disease, they have not been validated for syndromic treatment yet. Since September 2017, Brazil recommends the prescription of ceftriaxone (500 mg) combined with azithromycin (1 g), or azithromycin (2 g, to beta-lactams allergic individuals) to gonorrhea treatment. Indeed, a study performed by our group with 93 isolates obtained by clinical laboratories between March 2014 and October 2017 in Rio de Janeiro showed 98%, 78%, and 72% non-susceptibility to penicillin, tetracycline, and ciprofloxacin, respectively. About azithromycin, 25% of the isolates were not susceptible (MIC ≥ 2 µg/mL), with a tendency of rising rates along the four years of the study. The present work is a continuation of this project with 26 *N. gonorrhoeae* isolates received by our research laboratory between January 2018 and March 2019 from clinical laboratories located in Rio de Janeiro. We determined, by agar dilution, the minimal inhibitory concentration (MIC) of ciprofloxacin, azithromycin, cefixime and ceftriaxone for these isolates, using *N. gonorrhoeae* ATCC 49226 as control. Identification of isolates was confirmed by MALDI-TOF (Bruker). Gonococcus were included in the study without any additional selection criteria. Results showed that 73% of the isolates were non-susceptible to ciprofloxacin, with 18 isolates presenting MIC between 2 µg/mL and 16 µg/mL. Regarding azithromycin, 38% of isolates were non-susceptible, with 10 isolates showing MIC between 2 µg/mL and 16 µg/mL. All isolates were susceptible to cefixime and ceftriaxone with MIC varying from ≤0.015 µg/mL and 0.125 µg/mL. Our results identified full susceptibility to cefalosporins in these isolates obtained in Rio de Janeiro but raise an alert about the growing rate of azithromycin resistance among these strains. Use of the early treatment based on ciprofloxacin and azithromycin should be avoided given the risk of therapeutic failure.

Keywords: azithromycin, cephalosporins, ciprofloxacin, minimal inhibitory concentration *Neisseria gonorrhoeae*

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