Thesis Title Comparison of the E-test to Agar Dilution Susceptibility Technique and Antimicrobial Susceptibility of *Neisseria gonorrhoeae*

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ABSTRACT

Antimicrobial susceptibility testing of *Neisseria gonorrhoeae* is essential for surveillance purpose and is a guide in selection of effective drug for the therapy. The widely used method for routine susceptibility testing of *N. gonorrhoeae* is the agar diffusion technique, that is a qualitative method while the reference MIC determination is the agar dilution technique. However, agar dilution is not appropriate in routine used and has several disadvantages in practice. The E-test, a new in vitro susceptibility technique that has several advantages over the conventional methods, was used in comparison with the NCCLS reference agar dilution method for determining susceptibility of *N.gonorrhoeae* on Modified New York City agar. In 49 strains of *N. gonorrhoeae* including 23 penicillinase-producing strains (PPNG) and 26 non penicillinase-producing strains (nonPPNG), the E-test gave agreement within =1 $\log_2$ dilution of 93%, 93.8% and 93.4% for PPNG, nonPPNG and both groups, respectively. The Pearson correlation coefficients were 0.70, 0.88 and 0.80 when

tested with PPNG, nonPPNG and both groups, respectively. Moreover, the E-test MIC results were not significantly different from the reference agar dilution MIC results ($P > 0.05$).

In addition, susceptibility testings of 200 *N. gonorrhoeae* isolated from patients at Bangrak Hospital during January to April, 1993 were studied against 6 antimicrobial agents. Sixty-nine (34.5%) of 200 strains were PPNG. All isolates were susceptible to aztreonam, ceftriaxone and ciprofloxacin. Decreasing susceptibility to cefoxitin was found in 5% of isolates. High prevalence of resistant was found with penicillin G and kanamycin of 48.5% and 9%, respectively. PPNG isolates were more significantly resistant to penicillin G ($P < 0.001$) and ciprofloxacin ($P < 0.01$) than nonPPNG but less significantly resistant to aztreonam ($P < 0.001$), cefoxitin ($P < 0.002$) and ceftriaxone ($P < 0.001$). There was no significantly difference resistant to kanamycin between PPNG isolates and nonPPNG isolates ($P > 0.05$). The drugs in beta-lactam group, *N. gonorrhoeae* were significantly more resistant to penicillin G than aztreonam ($P < 0.001$) and were significantly more resistant to cefoxitin than ceftriaxone ($P < 0.001$). In non beta-lactam group, they were significantly more resistant to kanamycin than ciprofloxacin ($P < 0.001$).

The E-test results were as reliable as the results obtained by the reference NCCLS agar dilution method. Thus, the E-test represents a potential alternative method for antimicrobial susceptibility testing of *N. gonorrhoeae*. Antimicrobial susceptibility pattern of *N. gonorrhoeae* is changed from previous studies. Aztreonam, ceftriaxone and ciprofloxacin are the most active agents. However, ceftriaxone is the most suitable that recommended in this study.