

Antimicrobial Susceptibility of *Helicobacter pylori* Isolated from Dyspeptic Patients in a Teaching Hospital in Riyadh, Saudi Arabia

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Abstract - Metronidazole resistance is emerging as an important cause of treatment failure of *Helicobacter pylori* (*H. pylori*) associated diseases. *H. pylori* strains isolated from 55 Saudi dyspeptic patients were tested for susceptibility to metronidazole (MTZ), ampicillin, erythromycin, and tetracycline. Disc diffusion method was used because it is practical, reproducible, clinically applicable, and it correlates well with MIC and is inexpensive. Overall MTZ resistance was found in 41 strains out of 55 isolates (74.6%). Twenty five resistant strains were isolated from thirty-three female patients (76%). Ampicillin, erythromycin, and tetracycline resistance were 31% (17/55), 14.5% (8/55) and 8% (5/55) respectively. In conclusion, because of the high rates of resistance it is recommended that susceptibility of *H. pylori* to commonly used antibiotics be tested routinely to determine the appropriate treatment for peptic ulcer disease.

Keywords: *Helicobacter pylori*, Metronidazole resistance, Susceptibility testing.

The isolation, identification and susceptibility testing of *Helicobacter pylori* (*H. pylori*) may take more than a week and for this reason most microbiology laboratories do not perform susceptibility testing routinely. However, because of recent reports of increase in the prevalence of metronidazole (MTZ) resistant strains of *H. pylori*, some investigators do recommend routine testing¹. Most investigators however do not recommend routine testing of antimicrobial resistance in all patients with *H. pylori* infection.²⁻⁶ Williams⁷ concluded that where the incidence of MTZ and clarithromycin resistance is low, pretreatment susceptibility testing is not required. Additionally, it has been reported that strains susceptible to MTZ predict successful eradication of the organism from lesions while resistant strains predict failure of eradication.^{2,5,8}

The aim of this study was to provide information on the antibiotic susceptibility pattern of *H. pylori* isolated from dyspeptic patients seen for the first time at King Khalid University Hospital (KKUH) with emphasis on MTZ resistance.

Patients and Methods

This was a pilot study to determine susceptibility status of strains of *H. pylori* isolated from endoscopic biopsies of the pylorus of 55 Saudi patients (22 males, 33 females) with dyspeptic symptoms who presented for the first time to the primary care clinic and subsequently referred to the endoscopy unit of KKUH. The study was carried out in the period between June and November 1997 during which a total of 158 Saudi patients were biopsied. Biopsies from one hundred and three patients were culture negative and were not included in the study. None of the patients had been previously treated for

H. pylori infection or had known recent exposure to antibiotics. The biopsy specimens were placed in sterile saline and delivered to the microbiology laboratory immediately. In the laboratory, the specimens were teased using sterile forceps and inoculated into sheep blood agar and Skirrow's selective medium. The culture plates were then incubated in microaerophilic atmosphere of 5% oxygen, 10% carbon dioxide and 85% nitrogen (oxid gas generating kit, UK) at 37°C for 7 days and examined on days 4 and 7. Suspected colonies were selected and identified according to the Gram stain, positive catalase, oxidase and urease reaction, negative hippurate hydrolysis, resistance to nalidixic acid and susceptibility to cephalothin.

Antibiotic susceptibility testing was determined by disc diffusion method on blood agar and incubated in a microaerophilic atmosphere for 4 days. The antibiotics used were MTZ (5 µg) ampicillin (10 µg), tetracycline (10 µg), and erythromycin (E) (5µg). Strains with an inhibition zone of 10 mm or more were regarded as susceptible to the corresponding antibiotic.

Statistical Methods

Chi-square test was used to compare differences in prevalence of MTZ-resistant *H. pylori* strains among different sexes. P-value of <0.05 was considered significant.

Results

Biopsy specimens from 55 patients grew *H. pylori* and antimicrobial susceptibility testing was performed on all of them. No difference was found in the mean age of both sexes (39 and 38 years). Table I shows susceptibility patterns of *H. pylori* to the antimicrobial agents tested. Forty one (74.6%) *H. pylori* isolates were MTZ-