ORIGINAL ARTICLE

The Prevalence of Helicobacter Pylori and Gastritis in Oman

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ABSTRACT

Background and objectives: Helicobacter pylori (*H. pylori*) are considered to be the most common human infectious agents leading to gastritis, ulcer and probably stomach cancer. The aim of this study was to evaluate the prevalence of *H. pylori* infection and histologic gastritis in Oman using endoscopy biopsy of the stomach.

Methods: A total of 366 stomach biopsies (171 males and 195 females) were histologically analyzed at Sultan Qaboos University Hospital, Muscat, Sultanate of Oman, between 2007 and 2010, using haematoxylin and eosin, Giemsa and Alcian blue/periodic acid-Schiff stains.

Results: Out of 366 cases, 110 (30.1%) were positive for *H. pylori* infection. Out of 110, 76 cases were associated with active chronic gastritis, 32 cases with chronic gastritis and one case each with gastric carcinoma and normal histological features. The maximum number of *H. pylori* organisms was found among young (26 – 44 years) and middle age (45 – 59 years) groups, 34.5% and 30.9%, respectively. *H. pylori* was present in 36.9% females and in 22.2% of males. 40.9% of *H. pylori* was found in the gastric antrum site, and the gastric cardia was free of *H. pylori*.

Conclusion: *H. pylori* associated active chronic gastritis is the most common form of stomach diseases encountered in this study. In addition, female, young and middle age group and gastric antrum had the highest frequency of *H. pylori* organisms. *J Dig Endosc* 2013;4(2):29-32

Key Words: Gastritis- *Helicobacter pylori* – Oman - Prevalence – Chronic active gastritis

Introduction

Helicobacter pylori (*H. pylori*), a gram negative spiral shaped bacillus, is considered to be the most common human infectious agents leading to gastritis, ulcer and probably stomach cancer. In fact, it is classified as a class I carcinogen for gastric cancer.[1] Despite the success in several diagnostic methods for the detection of *H. pylori* such as endoscopy, urea breath test, stool and blood samples and the improvement in socioeconomic status, infection with *H. pylori* is still on rise. In developing countries such as Ethiopia, India, Sri Lanka, Bangladesh, Mexico and Brazil, the prevalence of *H. pylori* infection is 80% whereas in the developed countries such as USA, Canada, Australia, Netherland and Switzerland, the prevalence is only 30%.[2,3] In addition to the socioeconomic status, age, gender, ethnicity, sanitation, educational level and genetic predisposition are important factors that affect the prevalence of *H. pylori* infection. Unfortunately and according to our knowledge, there are no data on the prevalence of *H. pylori* in Oman. Thus the aim of this study was to evaluate the relationship between *H. pylori* infection and stomach diseases in Oman using endoscopy biopsy of the stomach.

Methods

This retrospective study was approved by the Medical Research Committee and Ethics Committee (MREC # 520) from the College of Medicine and Health Sciences, Sultan

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Qaboos University, Sultanate of Oman. During the period from 2007 to 2010, 366 reports were reviewed. Age, gender, site of biopsy, histological findings and the presence of *H. pylori* were analyzed.

The stomach biopsies, which were obtained endoscopically, were fixed overnight in 10% neutral buffered formalin, histoprocessed, embedded in paraffin wax, cut at $3\mu m$ thickness and stained with haematoxylin and eosin method for general morphology, Giemsa method for demonstrating *H. pylori* organisms and Alcian blue/periodic acid Schiff method for demonstrating acid and neutral mucins. Known positive cases of *H. pylori* were run in parallel with the tests.

Statistical analysis

The data were analyzed using Statistical Package for Social Science (SPSS) ver. 16 (Chicago, USA).The cross tabulation statistic by applying chi square and continuity correction tests were performed in all the data collected from cases of stomach biopsies to find the association between the presence of *H. pylori* and stomach diseases. Differences in statistical analysis of data were considered significant at $p < 0.05$.

Results

Prevalence of *H. pylori*

A total of 366 cases were studied, 171 (46.72%) were males with mean age of 47.87 ± 19 years and 195 (53.27%) were females with mean age of 45.21 ± 17.56 years. Out of 366 patients, 110 cases (30.05%) were positive for *H. pylori* and 256 (69.95%) were negative. In males, the frequency of *H. pylori* was found to be 38 (34.5%) while in females 72 (65.5%). Histopathological findings showed that chronic gastritis was present in 33.3% of stomach biopsies, followed by active chronic gastritis (27.3%). Table 1 summarizes the histopathological findings.

Out of 110 of *H. pylori* positive cases, 76 (69.1%) were associated with active chronic gastritis which was statistically significant ($p < 0.05$). Thirty two cases positive for *H. pylori* were associated with chronic gastritis. However, there was no significant association between the *H. pylori* and chronic gastritis ($p > 0.05$).The remaining two positive cases of H. pylori were each associated with adenocarcinoma and normal findings (Table 2).

Table 1: Histopathological findings of 366 cases

Histopathological findings	Number	%
Chronic gastritis	122	33.3
Active chronic gastritis	100	27.3
Adenocarcinoma	60	16.4
B-celllymphoma/reflux gastropathy	39	10.7
Normal	37	10.1
Gastric ulcer	8	2.2

Table 2: Correlation between chronic gastritis and the presence of *H. pylori*

Histology	H. pylori		Total
	Absent	Present	
Chronic gastritis	90	32	122
Others	166	78	244
Total	256	110	366

Others include: Active chronic gastritis, adenocarcinoma, normal histological limit, B- cell lymphoma/ reflux gastropathy and gastric ulcer.

The highest frequency of *H. pylori* infection was seen in 26 - 44 age group and the lowest in 0-14 age group. However, there was a non linear association regarding the age group of the patients and the presence of *H. pylori*. ($\chi^2 = 0.012$, $p < 0.05$)(Figure 1). Out of 110 cases, 45 (40.9%) of *H. pylori* were found in the antrum and 26 (23.6%) in antrum and body of the stomach. There were no *H. pylori* present in the cardia (Figure 2).
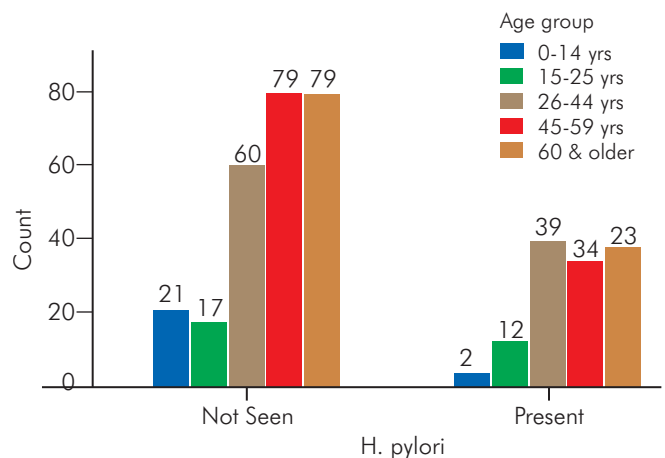

Figure 1: The frequency of *H. pylori* among different age groups

Discussion

The importance of *H. pylori* infection comes from the fact that stomach cancer is the commonest cancer in males and the fifth top cancer in females in Oman.[4]The main cause of stomach cancer is unknown but numerous studies correlated it with the infection of *H. pylori*.[5-9] In this prospective study, *H. pylori* was found in 30.1% of 366 stomach cases in the four year period studied. This percentage is low when compared with other neighboring Gulf countries. In United Arab Emirates, Saudi Arabia and Kuwait, *H. pylori* was positive in 90.39% of 437, 54.9% of 488 and 96.6% of 204 stomach biopsies, respectively.[10-12]Similarly, comparing the finding of this study with other Arabic Asian countries, it was found that *H. pylori* was high in Yemen and Jordan where 82.2% of 275 and 82% of 197 stomach biopsies, respectively, were reported.[13,14] In addition, comparing the finding of the present study with other non-Arabic Asian
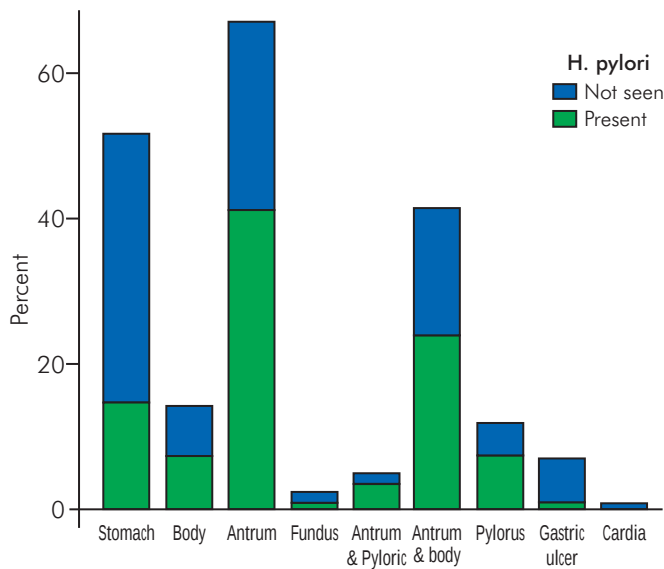
Figure 2: Most common areas of the presence of *H. pylori* in stomach biopsies

countries such as India and Iran, it was found that *H. pylori* was positive in 61.3% and 67.1%, respectively.[15,16] Despite the fact that dyspepsia is a common reason for patients seeking medical services in Oman, the low rate of *H. pylori* infection in this study could be due to the selected sample population which was based in one governmental hospital and in one region of the Sultanate of Oman.

One of the important findings of the present study was the significant association between the presence of *H. pylori* and active chronic gastritis. *H. pylori* associated active chronic gastritis was found in 69.1% of all cases. This finding is inline with other study.[17] This might indicate that *H. pylori* is a contributing factor or a marker for active chronic gastritis. Surprisingly, there were no *H. pylori* infection in the eight cases of gastric ulcer. This finding is in contrast with the general information reported in the literature that *H. pylori* is mostly associated with gastric ulcer.

The majority of infected individuals with *H. pylori* was more pronounced in the antrum site rather than in the body, fundus, pylorus, stomach or even in the cardia, which showed the absence of this organism. Similar findings have been reported.[10,12,18] This indicates that antral biopsy gives a great yield of *H. pylori* whereas other sites might miss the organism. The recommendation might suggest to take two biopsies from different sites to avoid sampling error for detecting *H. pylori* organism.

In this study, *H. pylori* infection was more common in young 26- 44 years and aged adults 45-59 years. This figure is consistent with those reported in the literature. Low prevalence of *H. pylori* infection was seen in younger age groups.[19] Moreover, another study reported high prevalence of *H. pylori* infection in age group 31-50 years.[20] It was noticed that the number of pediatric patients are less in this study compared with other studies which may cause little bias to this finding. There are two possibilities for the difference in

the prevalence of *H. pylori* with age. Either risk factors for the infection in adults differ from those during childhood and the observed increase among this age group could be predominantly a cohort effect.

Interestingly, the prevalence of *H. pylori* in females was 65.5% whereas in males 34.5%. This finding is in disagreement with other studies, where males had more of *H. pylori* infection than females.[16] The high rate of *H. pylori* infection in females that was found in this study could be linked to the iron deficiency anemia, which is more common in females.[21,22] As a limitation of this study, we should point out that this study was restricted to one hospital and in one region of Oman as well as the absence of other diagnostic methods for detecting *H. pylori* organism.

Conclusions

In conclusion, *H. pylori* associated active chronic gastritis is the most common form of stomach diseases encountered in this study. In addition, female, young and middle age group and gastric antrum had the highest frequency of *H. pylori* organisms.

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