ORIGINAL ARTICLE
HELICOBACTER PYLORI PREVALENCE AND HISTOPATHOLOGICAL FINDINGS IN DYSPEPTIC PATIENTS

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Background: Helicobacter pylori (H. pylori) colonizes in half of the population of developed and nearly all inhabitants of developing countries. The infection is characterized by gastritis but can present more complicated disease states. We intended to report prevalence of H. pylori infection by histopathology and presence of gastritis, activity, atrophy and intestinal metaplasia in dyspeptic patients of Islamabad, Pakistan. Methods: Ninety four patients identified to be dyspeptic on the basis of Rome III criteria were included in the study and diagnosed for H. pylori status by Histopathology. The grading and severity of gastritis was documented as nil, mild, moderate or severe, based on the Sydney system. Activity was recorded as present when an increase in the number of neutrophils was observed. Atrophic changes and intestinal metaplasia were also determined. Results: Eighty three out of total 94 (88.3%) patients were positive for H. pylori on histopathology. Out of total 94 patients, chronic gastritis was observed in 89 (94.6%), evidence of activity was found in 37 (39.4%), atrophic changes were observed in 66 (70%) and intestinal metaplasia was present in 4 (4.3%) patients. Conclusion: H. pylori infection in dyspeptic patients of Islamabad appears to be more related with gastritis.

Keywords: Helicobacter pylori, Histopathology, Dyspepsia, Gastritis, Pakistan

INTRODUCTION

The discovery of H. pylori and its association with gastric problems has revolutionized the perception and management of gastric disorders. Peptic ulcer disease is no more considered a chronic recurrent disorder; rather it is now an infectious disease curable by the use of antibiotics. H. pylori has been considered associated with acute and chronic gastritis, gastric and duodenal ulcers, lymphoma and even cancer.12 Like all developing countries, Pakistan also has high H. pylori prevalence reported in the range of 50–90%.3–5 The reason for such a huge variation in prevalence range may be use of different diagnostic techniques and population studied.

H. pylori infection can be diagnosed by invasive or non-invasive methods. Invasive methods require endoscopy and sampling of the biopsy tissues that can be used for histological examinations, culture or direct molecular examination. Non-invasive methods include antigen/antibody tests, urea breath test (UBT) or molecular detection techniques. Histological examination is the most commonly employed invasive method of H. pylori detection in clinical setting. Hematoxyllin and Eosin, Giemsa, and silver staining are commonly used for detection of H. pylori in the tissue sections of paraffin embedded gastric mucosa specimens.8

Despite very high prevalence of H. pylori infection, limited basic and applied data on H. pylori prevalence and its association with different clinical presentations is available from Pakistan. Genetic diversity of H. pylori, generally lower socio-economic status in Pakistan than that in the developed world and limited access to healthcare facilities in Pakistan warrant more research on different aspects of H. pylori infection. There is limited data available on morphological changes in gastric environment followed by H. pylori infection. We have previously reported the seropositivity of H. pylori infection and association of various risk factors with positive H. pylori status.7,9 In this study, we intended to report prevalence of H. pylori infection and associated morphological changes in gastric mucosa that is gastritis, activity, atrophy and intestinal metaplasia in dyspeptic patients of Islamabad, Pakistan by histopathology.

MATERIAL AND METHODS

This cross-sectional study was conducted in Gastroenterology Clinic of Shifa International Hospital (SIH), Islamabad during the period from July 2007 to June 2008. Three hundred and eighty five consecutive dyspeptic patients were initially enrolled on the basis of qualifying Rome-III criteria after an interview by the gastroenterologist. Out of these, 116 patients were excluded due to presence of peptic ulcer disease, gallstones or positive HCV status. Remaining 269 patients were entered in the data collection forms after obtaining the informed consent. The study was approved by the institutional review board of SIH. The specific type of investigation tests (endoscopy with histopathology or ELISA) was determined by the gastroenterologist.
on the basis of specific needs of the patient and affordability.

Ninety four dyspeptic patients underwent upper gastrointestinal endoscopy in SIH, Islamabad, Pakistan. The endoscopic examination was carried out by the gastroenterologist using Olympus CV-160, CLV-160 and GIF-160 system (Olympus, Japan). Four biopsies were collected from each patient (two each from body and antrum of the stomach). The histopathological confirmation of \textit{H. pylori} infection was accomplished by H&E and where required by Giemsa staining. The presence of \textit{H. pylori} was graded as absent or present. The grading and severity of gastritis was documented as nil, mild, moderate or severe, based on the Sydney system.\textsuperscript{10} Gastritis was confirmed on finding increased number of mononuclear inflammatory cells in lamina propria. Activity was recorded as present when an increase in the number of neutrophils was observed. Atrophic changes (damaged gastric lining leading to loss of gastric glandular cells) and intestinal metaplasia (replacement of gastric mucosal cells by resembling intestinal mucosal cells) was also determined.

**RESULTS**

The antral biopsies of 94 dyspeptic patients were tested for \textit{H. pylori} presence, graded for gastritis and other morphological changes like atrophy and intestinal metaplasia. There were 61 (64.9\%) males and 33 (35.1\%) females. The mean age and body mass index (BMI) of subjects were 45±6.3 years and 26.2±1.8 respectively. The status of \textit{H. pylori} was positive if bacteria were seen in the tissue samples (Figure\textsuperscript{-1}). The prevalence of \textit{H. pylori} was 88.3\% in these dyspeptic patients. Grading of inflammation was decided according to Sydney System. In the present study, histopathological examination of 94 patients revealed chronic gastritis in 89 (94.6\%); mild in 51, moderate in 38 and severe in 4 patients. Evidence of activity was found in 37 (39.4\%); mild in 16, moderate in 18 and severe in 3 patients. Atrophic changes were observed in 66 (70\%); mild in 46, moderate in 15 and severe in 5 patients. Intestinal metaplasia was present in 4 patients (4.3\%); mild in 1 and moderate in 3 patients (Table\textsuperscript{-1}). Gastric atrophic changes were observed in 70\% of the patients (66 out of 94), though sever atrophic changes could only be observed in 7.5\% (5 out of 66) patients with atrophy.

**Table-1: Histopathological findings and grading of gastric biopsy tissue samples (n=94)**

<table>
<thead>
<tr>
<th>Findings</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastritis</td>
<td>48</td>
<td>37</td>
<td>4</td>
<td>89 (94.6)</td>
</tr>
<tr>
<td>Activity</td>
<td>16</td>
<td>18</td>
<td>3</td>
<td>37 (39.4)</td>
</tr>
<tr>
<td>Atrophy</td>
<td>46</td>
<td>15</td>
<td>5</td>
<td>66 (70)</td>
</tr>
<tr>
<td>Intestinal metaplasia</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>4 (4.3)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

\textit{H. pylori} is considered to be the most important cause of human gastritis, duodenal and gastric ulcers and has been classified as class-1 human carcinogen.\textsuperscript{11} The usual disease progression following \textit{H. pylori} infections is gastritis followed by atrophy, intestinal metaplasia and dysplasia that can lead to carcinoma of gastric mucosa. Gastritis is developed in almost all individuals infected with \textit{H. pylori} whereas gastric atrophy and intestinal metaplasia appear more often in \textit{H. pylori} positive than in negative patients.\textsuperscript{12,13} Prevalence of 88.3\%, though seems on the higher side as compared to generally reported, however corresponds to some reports like 84.6\%, by another group using PCR in the same region.\textsuperscript{6} It is generally accepted that prevalence varies with the method of investigation employed.

Histological examination is the most commonly employed invasive method of \textit{H. pylori} detection in clinical setting. Hematoxylin and eosin, Giemsa, and silver staining have been used for detection of \textit{H. pylori} in the tissue sections of paraffin embedded gastric mucosa specimens.\textsuperscript{8} Accuracy of histology for \textit{H. pylori} detection may depend on the adequate number of gastric biopsies, rightly chosen biopsy sites or skill of the pathologist. The advantages of histology are detection of \textit{H. pylori} and its colonization density, and information
about morphological changes in the gastric mucosa demonstrating gastritis, atrophy, intestinal metaplasia, dyspepsia or malignancies.14

The finding that gastritis was present in almost all infected patients is in complete agreement with other reports where gastritis was found present in more than 90% of H. pylori infected patients.15,16 Presence of intestinal metaplasia in only 4% of the patients is an interesting finding. H. pylori infection has been considered to be most important but not the only risk factor for atrophy and intestinal metaplasia, the key changes leading to gastric cancer development. A comparative study conducted in China reported a generally higher rate of atrophic changes and presence of intestinal metaplasia in gastric ulcer patients than that in gastritis patients.17

Genetic diversity and origin of the infecting H. pylori strain are the major factors that determine the outcome of disease in most cases. Virulent H. pylori cytotoxin-associated gene A (cagA) positive strains are considered to be associated with more severe disease state as patients infected with cagA positive strains had higher risk of gastric cancer development than those cagA negative strains.18 Various studies reported that 60–70% of H. pylori strains isolated from North American and European populations had cagA gene19,20 whereas, over 90% of strains isolated from China and Asia-Pacific have been reported cagA positive.21,22 Ahmad et al, (2009) however reported lower prevalence (24%) of cagA positive H. pylori strains from Pakistani dyspeptic patients than that reported from other countries of the region.6 This lower prevalence of highly virulent H. pylori strains may be attributed to less severe gastric atrophy and generally lower prevalence of intestinal metaplasia in Pakistani, however more focused studies are required to confirm such findings. There has been reported at-least another H. pylori genetic marker associated with cancer development23 that is being developed besides cagA to identify patients at risk for cancer development presenting advanced H. pylori disease states.24,25

CONCLUSION

Prevalence of H. pylori infection in Pakistani population is alarming. Gastritis is the major condition associated with Pakistani dyspeptic patients. Low prevalence of severe atrophy and intestinal metaplasia predict low risk of gastric cancer.

ACKNOWLEDGMENTS

We are thankful to Pakistan Higher Education Commission (HEC) for funding this research work.

REFERENCES:


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