Histopathological study of endoscopic gastric biopsies in dyspeptic patients with special correlation to helicobacter pylori

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Abstract

Aims: 1. To identify various pathological lesions in gastric biopsies in patients with dyspeptic symptoms. 2. To determine that H. pylori is a major etiologic organism in the pathogenesis of chronic gastritis and to assess the graded variables of Helicobacter associated gastritis.

Materials and methods: A total of 93 cases with complaint of dyspepsia were studied during the period July 2016 to July 2017. Endoscopic examinations as well as biopsy specimens from gastric mucosa were studied in all the cases for the various mucosal lesions.

Results: Out of 93 cases studied, dyspepsia was most common clinical symptom seen in 80 patients. On endoscopy, 18 patients showed normal appearance and erythema was the most common finding in 40 patients. On histopathology, 6 were normal, 80 cases showed various forms of chronic gastritis and 7 cases were malignant. Out of 80 cases of chronic gastritis, 43 showed H. pylori positivity. Most of the H. pylori positive cases were associated with activity and mononuclear inflammatory infiltrate.

Conclusion: Prevalence of H. pylori in the present study was 46.2% in patients undergoing upper gastro-intestinal endoscopic biopsies. H. pylori associated gastritis is the predominant type of gastritis. Accurate endoscopic and histopathological examination of gastritis according to the Sydney grading system is a valuable indicator of H. pylori infection.

Keywords: Dyspepsia, H pylori, endoscopic gastric biopsy

Introduction

Gastro-duodenal diseases are the commonest diseases in adult population worldwide. Dyspepsia, which includes upper abdominal discomfort with or without nausea, vomiting or bloating, is one of the most common presentations in any Gastroenterology Department. Endoscopic gastric mucosal biopsies are frequently done for such patients mainly to rule out various forms of gastritis including H pylori induced gastritis. H. pylori have been implicated in several gastrointestinal diseases, including gastritis, peptic ulcer, duodenal ulcer, and gastric adenocarcinoma. The prevalence of Helicobacter pylori infection varies from country to country with large differences between developed and developing countries [1, 2, 3, 4]. Studies reported that its prevalence ranged from <15% in some populations to virtually 100%, depending on socioeconomic status and country development [5, 6]. Epidemiological evidence suggests that many people acquire infection in childhood. The prevalence of the infection increases with age, although this may be a large cohort effect. The mode of transmission is unknown but proposed route include oral-oral, faecal –oral [7].

Helicobacter pylori, the spiral-shaped gram-negative bacterium is found to colonize in gastric mucosa or adherent to the epithelial lining of the stomach [8]. The organism was first discovered and reported in 1983 by Warren and Marshall. International agency for research on cancer has categorized H pylori as a group 1 carcinogen [9]. The recognition that Helicobacter pylori play a pivotal role in the pathogenesis of several gastroduodenal pathologies makes its diagnosis necessary in many different circumstances [10, 11].

A number of tests may be used to confirm the presence of Helicobacter pylori. These fall into 2 categories; those that rely on non-invasive methods to detect the infection, such as serology, urea breath test, fecal antigen test and invasive requiring endoscope evaluation includes bacteriologic culture, histopathologic studies, cytological examination of smear, rapid urease test or CLO test and molecular studies. Several studies have shown high sensitivity and specificity of rapid urease test,
histology and culture for detection of *Helicobacter pylori* in gastric biopsy. Mengaud and Fallone consider histological methods as the “Gold Standard” for the demonstration of *H. pylori* in endoscopic biopsies, taken from patients with the gastritis- peptic ulcer syndrome. Factors other than the direct demonstration of the organism, can support the histological diagnosis of *H. pylori*. The incidence of gastric carcinoma has declined worldwide; it still remains the second most common cause of cancer death. *H. pylori* and carcinoma stomach coexistence is high in India. In view of the above it was decided to take up a study to find out various histopathological gastric mucosal lesions and its correlation with *H pylori* infection.

AIMS and objectives
To identify various pathological lesions in gastric biopsies in patients with dyspeptic symptoms.
To determine that *H. pylori* is a major etiologic organism in the pathogenesis of chronic gastritis and to assess the graded variables of Helicobacter associated gastritis.

Materials and Methods
This study was conducted in the Department of pathology, Subbaiah institute of medical sciences, Shivamogga. A total of 93 endemic gastric biopsies were studied from July 2016 to July 2017 prospectively. The patient's age, sex, detailed clinical history, upper gastrointestinal endoscopy findings and other relevant laboratory investigations were documented.

Inclusion Criteria: (i) Cases of all ages and both sexes with upper gastrointestinal symptomatology (ii) Full mucosal thickness endoscopic biopsies incorporating muscularis mucosae. Exclusion criteria: (i) Patients who had taken Hp eradication treatment such as antibiotics, proton pump inhibitors, or H2 antagonists in the 4 weeks before endoscopy. (ii) Superficial gastric biopsy specimens.

The endoscopic biopsies studied were taken from the antrum, corpus, and edge of ulcer or any areas of mucosal abnormalities. Serial sections of 4-5μ thickness were obtained from formalin fixed paraffin embedded tissue and stained with hematoxylin and eosin (H and E). Giemsa stain was done for each of the biopsy specimen to demonstrate *H. pylori*. *H pylori* were identified as curved rods or coccoid forms. Lymphocytes and plasmocytes infiltration indicate chronic inflammation of *H pylori* and polymorphonuclear (PMN) cell infiltration stand for activity of *H pylori* infection. The histological glandular atrophy was identified when the gastric glands were correspondingly decreased in amount and/or widely separated.

Cases of chronic gastritis were graded according to the grading system provided by Houston-updated Sydney system which was depended on the intensity of mononuclear inflammatory cellular infiltrates within the lamina propria into four scales as

**Grade 0:** Absent inflammation
**Grade 1:** Mild inflammation
**Grade 2:** Moderate inflammation
**Grade 3:** Severe inflammation

Other Morphological changes such as reparative atypia, dysplasia, metaplasia, & malignant change were noted.

Results
A total of 93 cases were studied with most common symptom being dyspepsia. The age range of the patients was from 18 to 75 yrs with a mean age of 55 yrs. Maximum numbers of cases, belonged to age group of 51-60 years (32%). There were 58 male patients and 35 female patients with M: F ratio of 1.65: 1.

Clinical profile
Dyspepsia was the main indication for endoscopic biopsy in our study. It was present in 80 out of 93 patients. In dyspeptic symptoms following were the common presentations either alone or in combinations. Vague upper abdominal pain, nausea, vomiting and burning sensation in the epigastrum after meal. Other major indications for gastric biopsies were anemia, weight loss and upper GI bleed.

Table 1: Clinical profile

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspepsia</td>
<td>80 (86.02%)</td>
</tr>
<tr>
<td>Anemia</td>
<td>18 (19.3%)</td>
</tr>
<tr>
<td>Weight loss</td>
<td>10 (10.7%)</td>
</tr>
<tr>
<td>GI bleed</td>
<td>5 (5.37%)</td>
</tr>
</tbody>
</table>

Endoscopic findings
Out of 93 cases, 86 were benign lesions and 7 malignant lesions. Among 86 benign lesions, 18(20.9%) patients had normal appearance, 40 (46.5%) cases appeared erythematous, 14(16.2%) ulcerative, 7(8.13%) cases of thickened gastric fold, and 4(3.44%) patient showed erosion and healed scar, in 3(3.48%) case showed nodularity. Out of 7 malignant lesions, 4(57.1%) appeared polypoid, 2(28.5%) were ulcerative and 1(14.2%) was showing flattening of mucosa. Regarding the anatomical location of endoscopic gastritis, antral gastritis was found in 48 patients, and antrum predominant pangastritis and corpus predominant pangastritis in 10 patients each.

Histopathological findings
Out of 93 cases, 6 were normal in histopathology, 80 cases showed various forms of chronic gastritis and 7 cases were malignant.

Out of 80 cases of chronic gastritis, 56 cases showed neutrophilic activity of varying grades with mild in 27 (48.2%) cases, moderate in 18(32.14%) and severe activity/ crypt abscess in 11(19.6%) cases. *H. pylori* were seen in 43 cases with mild density in 10(23.25%) cases, moderate in 15(34.8%) cases and severe in 18(41.8%) cases. Mononuclear infiltration of varying grades was seen in 42 cases, with G1 (Grade 1) in 22(52.3%) cases, G2 (Grade 2) in 18(42.8%) cases and G3 (Grade 3) in 2(4.7%) cases. Lymphoid follicle formation was noted in 4 cases. Intestinal metaplasia of varying grades was seen in 24 cases with mild in 12 (50%) cases, moderate in 10(41.6%) cases and severe in 2(8.3%) cases. Dysplastic changes were associated with metaplasia was found in 4 cases. 18 cases showed presence of atrophy among which 10 cases were associated with intestinal metaplasia.
Table 2: Histopathological grading in chronic gastritis (updated Sydney system).

<table>
<thead>
<tr>
<th>Neutrophilic Activity</th>
<th>Hp Colonization</th>
<th>Atrophy</th>
<th>Intestinal Metaplasia</th>
<th>Mononuclear Infiltrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>27</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Moderate</td>
<td>18</td>
<td>15</td>
<td>07</td>
<td>10</td>
</tr>
<tr>
<td>Severe</td>
<td>11</td>
<td>18</td>
<td>00</td>
<td>02</td>
</tr>
</tbody>
</table>

Fig 1: Histopathological grading in chronic gastritis (Updated Sydney system)

There were 7 malignant lesions of stomach. Out of which 5 (71.4%) were intestinal type of adenocarcinoma and 2 (28.5%) were diffuse adenocarcinoma. Site wise distribution showed 5 (71.4%) cases from antrum and 2 (28.5%) cases from body of stomach.

Discussion
Biopsy sampling of the gastric mucosa at diagnostic endoscopy provides information that cannot be obtained otherwise. Microscopic examination of gastric biopsy specimens gives, in addition to H. pylori status, information about the grade, extent, and topography of gastritis and atrophy-related alterations in the gastric mucosa. This information provides further possibilities for the assessment of risk and likelihood of various gastric disorders.

Endoscopic appearance
In this study, the endoscopic findings of gastritis revealed a significant relation between the following variables: erythema, ulceration and mucosal nodularity. Antral type of gastritis is a major form of gastritis. Our endoscopic findings are in agreement with Khakoo et al. and Calabrese et al.

Histologic Appearance
Chronic gastritis was seen in 80 of 93 cases (86.02%). Chronic inflammation was located in the antrum in the 58 (72.5%) out of 80 cases similar to Singh R et al. study. The main reason for antral predominant gastritis could be due to the predominantly antral location of H. pylori. According to Mysorekar et al. 52% of Indians with dyspepsia and 44% of control subjects have active H. pylori infection by second decade of life.

In the present study histological gastritis was seen in 33.3% of endoscopically normal patients. Whereas in a study by Prabhu SR et al. showed histological gastritis in 66% of asymptomatic and endoscopically normal individuals. Endoscopic mucosal breaks (erosions) have a stronger association with histological gastritis. In our study H. pylori was identified in 43 (53.7%) of 80 cases of chronic gastritis. In a study by Singh et al. 96% of chronic gastritis showed H. pylori positivity. In the present study 56 (70%) cases showed presence of activity similar to the study by Zhang et al.

The normal gastric mucosa contains very few lymphocytes in the lamina propria. Lymphoid follicles and aggregates are characteristic of H. pylori-associated gastritis. Lymphoid follicle prevalence between 27.4% and 100% has been reported in gastric mucosa from patients with H. pylori-associated gastritis.

Intestinal metaplasia was present in 24 (30%) of the 80 cases showing evidence of gastritis. This figure is similar to 20% reported in the study by Satarkar et al. In western literature intestinal metaplasia has been found in 12-51% of cases.

No correlation was seen between the presence of H. pylori colonization and intestinal metaplasia. This is similar to the findings of Satarkar et al. who also did not find significant relationship between the two. 18 (22.55%) of the 80 cases showed atrophy and 10 were associated with intestinal metaplasia. Atrophy in the fundal and body mucosa is closely linked to loss of acids secretion and to the development of intestinal metaplasia, which in turn is linked to an increased risk of gastric cancer.

Seven (7.5%) out of 93 gastric endoscopic biopsies were diagnosed as gastric carcinoma. Chronic inflammation plays an important role in development of various cancers, including H. pylori-associated gastric cancer. Gastric carcinoma is an important cause of cancer-related death, so
understanding the pathogenesis of *H. pylori* induced gastric carcinoma may improve the risk stratification for prevention and therapy. This is the only cancer which can be prevented by antibiotics by eradication of *H. Pylori*.

**Conclusion**

Chronic gastritis was commonest histological diagnosis in this study. *H. Pylori* was the commonest cause for gastritis (53%), mostly in the antral region. Symptomatic cases normal on endoscopy may show chronic gastritis histologically. Histopathology is the most sensitive test for diagnosing *H. pylori* on endoscopic biopsies. *H. pylori* gastritis usually shows increased neutrophilic activity but can also present with increased mononuclear inflammatory infiltrate and lymphoid follicles in chronic gastritis. Intestinal metaplasia and atrophy indicates the chronicity of the disease.

**References**


