Prevalence of Helicobacter Pylori among Patients undergoing Gastroduodenoscopy in a Hospital in Western Nepal

Raju Prasad Shakya, a,d Sudeep Regmi, b,e Suraj Adhikari c,d

ABSTRACT:
Introduction: Helicobacter pylori (H. pylori) related chronic gastritis is a major health problem worldwide, specially in the developing countries. The prevalence of H. pylori infection has been reported to vary between and even within countries. There are limited data on this infection in Western Nepal. Our objective was to study the prevalence of H. pylori infection and its association with presenting complains and upper gastrointestinal diseases. Methods: Medical records of patients undergoing gastroduodenoscopy and biopsy for various upper gastrointestinal symptoms from 1st of January 2015 to 30th of June 2017 were reviewed for presence of H. pylori infection, demographics, indications for gastroduodenoscopy, and histopathology findings. T-test, Chi-square test, and Fisher exact test were applied. Results: Two hundred fifty six patients (135 male and 121 female) with a mean age of 47 (SD = 16.5) underwent gastroscopic biopsy and had an overall H. pylori prevalence of 24.6%. H. pylori infection was most commonly noted between 41 to 60 years of age. Gender did not seem to be significantly associated (p = 0.82) but gastrointestinal bleed was significantly associated with H. pylori infection (p = 0.006). The most common histopathological diagnosis was gastritis followed by gastroduodenitis; however, none of the diagnosis were found to be significantly associated with H pylori infection. Conclusion: The overall prevalence of H pylori infection was 24.6% and was most common between 40 to 60 years of age. Heart burn was the most common symptom and gastrointestinal bleed was the only significantly associated symptom with H pylori infection.

Keywords: biopsy • gastric ulcer • gastritis • gastroscopey • H. pylori infection

INTRODUCTION:
Helicobacter pylori (H. pylori) infection is a common condition with an estimated half of the world's adult population having been exposed to this organism.[1] H. pylori is an important and a common bacterial pathogen infecting upper gastrointestinal (GI) track and causing various symptoms due to inflammation of the GI track. Prevalence of this infection varies worldwide being as low as completely negative to higher than 80 percentage in developing countries.[2,3] The prevalence rates are higher in developing nations. [3,4] Microbiologically, H. pylori are gram negative, spiral, and flagellated bacilli found under the mucous layer in gastric pits adjacent to the gastric epithelial cells.[5,6] Endoscopic biopsy based tests like rapid urease testing (RUT) and histopathology can be done to identify H. pylori. However, histopathology is considered the gold standard and carry high sensitivity and specificity of more than 90%. But such facilities may not be available in resource poor setting areas of the world; therefore, in low resource
communities with high H. pylori prevalence, empirical treatment could be more practical than diagnostic tests.[7,8] Non-invasive tests such as urea breath test, serological immunoglobulin G, A, and M serology, stool antigen test, and saliva antibody test are not easily available in our country.

There are many studies on this topic but there are limited information about the prevalence of H. pylori in Western Nepal. The present study evaluates the prevalence of H. pylori infection among patients undergoing gastroduodenoscopy for various upper GI symptoms.

**METHODS:**

This observational, cross-sectional, and analytical study was carried out at Endoscopic unit and Department of Pathology of Lumbini Medical College Teaching Hospital (LMCTH). Ethical clearance was obtained from Institutional Review Committee (IRC) of the institute. Secondary data were collected from 1st of August 2017 to 31st of October 2017. Data were collected retrospectively from the medical records of all patients who underwent gastroduodenoscopy from 1st of January 2015 to 30th of June 2017.

**Inclusion criteria:**
All patients who underwent gastroduodenoscopy for various upper GI symptoms and had histopathological examination of antral gastric mucosa were included in the study. GI symptoms for which gastroduodenoscopy was done included dyspepsia, dysphagia, heart burn, recurrent vomiting, GI bleeding, weight loss, and poor appetite.

**Exclusion criteria:**
Cases with incomplete data or in whom tissue was inadequate for histopathological opinion were excluded from the study. Cases taking proton pump inhibitor or who just completed anti-H. pylori treatment were also excluded.

**Procedure of gastroduodenoscopy and histopathology:**
Gastroduodenoscopy was performed as an outdoor clinic procedure using Fujinon™ 201H (2vA323) or 2500 (2V5640575) forward-viewing Esophago-gastro-duodenoscope. Gastric antral mucosal biopsy was taken for histopathological examination and sent to the Department of Pathology of the hospital in 10% formalin solution. Four micro thick paraffin sections were stained for H. pylori detection. Slides were stain with hematoxylin and eosin. Giemsa stain was also used for better yield. All the slides were examined by consultant pathologist. Diagnosis of H. pylori was made in presence of H. pylori organism in the histopathological slides (Fig 1). Absence of H. pylori in the slides ruled out H. pylori infection.

**RESULTS:**

There were 256 patients who fulfilled inclusion/exclusion criteria. Among them, H. pylori infection was present in 63 (24.6%) cases. Thus, the prevalence of H. pylori infection among patients undergoing gastroscopic biopsy was 24.6%. There were 34 (54%, N = 63) males and 29 (46%) females with H. pylori infection. There was no statistically
significant association \((p = 0.82)\) between gender and presence of \(H. pylori\) infection as shown in Table 1.

**Table 1: Association between gender and presence of \(H. pylori\) infection \((N = 256)\)**

<table>
<thead>
<tr>
<th>(H. pylori) infection</th>
<th>Present</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>34 (25.2%)</td>
<td>101 (74.8%)</td>
</tr>
<tr>
<td>Female</td>
<td>29 (24%)</td>
<td>92 (76%)</td>
</tr>
</tbody>
</table>

\(X^2 = 0.05, p = 0.82\)

The age range of patients undergoing gastroduodenoscopy was from 15 to 88 years \((median = 47)\) while the mean age was 47.07 years \((SD = 16.5)\) indicating a symmetric distribution of age of the patients. Mean age of \(H. pylori\) infected male was 52.5 years \((SD = 14.5)\) and that of female was 48.3 years \((SD = 16.5)\). This difference of age among gender was not statistically significant \((t = 1.07, df = 61, p = 0.29)\). Thus, the age of male and female patients infected with \(H. pylori\) was comparable between groups.

Frequency of \(H. pylori\) infected cases according to age is shown in Fig 2. It demonstrates that the infection is common between 40 to 60 years of age.

Relationship between various symptoms and presence of \(H. pylori\) infection is presented in Table 2. Heart-burn was the commonest \((n = 120, 46.9\%)\) complain followed by dyspepsia \((n = 61, 23.8\%)\). Among various symptoms, GI bleed was found to be significantly associated with \(H. pylori\) infection \((p = 0.006)\).

Most common histopathological diagnosis were gastritis \((n = 158, 61.7\%)\) followed by gastroduodenitis \((n = 50, 19.5\%)\). Frequency of other histopathological diagnosis and their association with \(H. pylori\) infection is presented in Table 3. None of the diagnosis were found to be significantly associated with \(H. pylori\) infection.

**Table 2: Association between \(H. pylori\) infection and various clinical symptoms \((N = 256)\)**

<table>
<thead>
<tr>
<th>Clinical Symptoms</th>
<th>Positive (n) (%)</th>
<th>Negative (n) (%)</th>
<th>Stats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspepsia</td>
<td>present 11 (18)</td>
<td>absent 52 (26.7)</td>
<td>(X^2 = 1.9, p = 0.17)</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>present 0</td>
<td>absent 63 (25.4)</td>
<td>(p = 0.2)*</td>
</tr>
<tr>
<td>Heart burn</td>
<td>present 28 (23.3)</td>
<td>absent 35 (25.7)</td>
<td>(X^2 = 0.2, p = 0.66)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>present 16 (30.2)</td>
<td>absent 47 (23.2)</td>
<td>(X^2 = 1.1, p = 0.29)</td>
</tr>
<tr>
<td>Gastro Intestinal</td>
<td>present 7 (36.4)</td>
<td>absent 56 (22.9)</td>
<td>(p = 0.006)*</td>
</tr>
<tr>
<td>Loss of Appetite/Wt loss</td>
<td>present 1 (33.3)</td>
<td>absent 62 (24.5)</td>
<td>(p = 0.57)*</td>
</tr>
</tbody>
</table>

\* - Fisher Exact; Stats - statistics

**Table 3: Association between histopathological diagnosis and \(H. pylori\) infection \((N = 256)\)**

<table>
<thead>
<tr>
<th>Histopathological Findings</th>
<th>(H. pylori)</th>
<th>Stats</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. pylori</td>
<td>Positive (n) (%)</td>
<td>Negative (n) (%)</td>
</tr>
<tr>
<td>Gastritis</td>
<td>present 38 (24.1)</td>
<td>absent 25 (25.5)</td>
</tr>
<tr>
<td>Esoepagitis</td>
<td>present 3 (33.3)</td>
<td>absent 60 (24.3)</td>
</tr>
<tr>
<td>Duodenitis</td>
<td>present 5 (29.4)</td>
<td>absent 58 (24.3)</td>
</tr>
<tr>
<td>Duodenal ulcer</td>
<td>present 2 (66.7)</td>
<td>absent 6 (33.3)</td>
</tr>
<tr>
<td>Gastric ulcer</td>
<td>present 2 (40)</td>
<td>absent 61 (24.3)</td>
</tr>
<tr>
<td>Normal</td>
<td>present 2 (40)</td>
<td>absent 61 (24.3)</td>
</tr>
<tr>
<td>Gastro-Duodenitis</td>
<td>present 10 (20)</td>
<td>absent 53 (25.7)</td>
</tr>
<tr>
<td>CA - Oesophagus</td>
<td>present 0</td>
<td>absent 63 (25)</td>
</tr>
<tr>
<td>CA Stomach</td>
<td>present 1 (20)</td>
<td>absent 62 (24.7)</td>
</tr>
</tbody>
</table>

Stats - statistics; CA - carcinoma; \* - Fisher Exact

Fig 2: Frequency curve of \(H. pylori\) infected patients for age
DISCUSSION:

Our study showed an overall prevalence of *H. pylori* infection of 24.6% among patients undergoing gastroscopy and biopsy. The prevalence was high in the age between 40 to 60 years. Frequency curve of *H. pylori* infection did not show any trends increasing with the advancing age. This can be due to fewer number of elderly patients.[9] This finding is similar to that of the study laid by Tarkhasvili et al.[10] However, studies by Shokrzadeh et al.[11] and Kaore et al.[12] reported increasing *H. pylori* infection in age groups of 20 - 40 years than the older age groups. Recently, several studies have reported declining prevalence of *H. pylori* infection over the last decade.[9,11]

We did not get a significant difference of *H. pylori* prevalence according to the gender. There are also some studies which have not found any sex differences.[13,14] In contrast, a study by Kaore et al.[12] found a higher prevalence in males. The reason for observed difference was not known but better hygienic practice may be the reasons for the lower prevalence in female.[15] To prove a strong correlation, it may require further studies.

There were several indications of gastroduodenoscopy. Heart burn was the most common (44.4%) followed by vomiting (25.4%), and dyspepsia (17.5%) among others. However, GI bleeding was only found to be statistically significant ($p = 0.006$). One of the study showed that a high prevalence of occult non steroid anti-inflammatory drug usages was found in *H. pylori* negative (PUD) patients which was based on elevated serum thromboxane.[16] In our study, 50% patients had non *H. pylori* PUD which might be the NSAID usages but we were not able to assess the association between NSAID and non *H. pylori* PUD because of incomplete data. In the present study, the commonest histopathological finding was gastritis ($n = 158, 61.7\%$). However, the correlation of different histopathological findings with *H. pylori* was not statistically significant. This is in concordance with the observation of Jemilohn. et al.[17] This may be due to low number of cases being evaluated in our study. *H. pylori* have been found in 90% of patient with chronic gastritis, 95% with duodenal ulcer, 70% with gastric ulcer and 50% with gastric cancer.[18] However, our study *H. pylori* was found in 24.1% of the patients with gastritis, 66.7% with duodenal ulcer, 40% with gastric ulcer, and 20% with carcinoma stomach. Such variation in prevalence is probably because of different dietary habits, life styles, immunological factors, and genetics of different countries.

There are several limitations in our study. Firstly, the retrospective study design is inherently associated with limitations. Secondly, few number of cases cannot be generalized into a larger population. Lastly, endoscopic procedures and histopathological evaluation was carried out by different physicians, surgeons, and pathologists. There was a chance of inter-observer variability.

CONCLUSION:

*H. pylori* infection was prevalent in 24.6% of the cases undergoing gastroduodenoscopy and biopsy. It was most common between 40 to 60 years of age. Male and female were equally likely to be infected. Heart burn was the most common symptom but gastrointestinal bleeding was the only significantly associated symptom with *H. pylori* infection. None of the histopathological diagnosis were significantly associated with presence of *H. pylori* infection.

Conflict of Interest:
None declared.

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REFERENCES:


