Original Article

# An association of *Helicobacter pylori* infection with endoscopic and histological findings in the Nepalese population

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## Abstract

**Background:** *Helicobacter pylori* (H. *pylori*) is one of the most common human infections worldwide particularly in the developing countries. We aimed to study an association of *H. Pylori* infection with endoscopic and histological findings in the Nepalese population. **Materials and Methods:** We conducted a study between Oct 2014 and Jan 2015 after meeting inclusion and exclusion criteria. Institutional Review Board approval was obtained from National Academy of Medical Sciences. Endoscopic findings and histopathological diagnosis were documented and data were analysed. **Results:** A total of 113 patients who had complete endoscopy were enrolled. The prevalence of H. *pylori* infections recorded was 27 (23.9%) patients. There were 17 (62%) male and 10 (37%) female infected with H. *pylori* ($P = 0.33$). All biopsied specimens were sent to pathology lab for examination. The most common endoscopic findings was erythematous antral gastritis (40.7%) followed by erosive gastritis 34 (30.1%), pangastritis 10 (8.8%), duodenal ulcer 13 (11.5%), gastric ulcer 9 (8%), erosive fundal gastritis 2 (1.8%), reflux esophagitis 10 (37%) ($P < 0.04$). Histology revealed that 23 (85.2%) patients had chronic active gastritis (CAG); ($P < 0.001$). **Conclusions:** Our study revealed that H. *pylori* infection is strongly associated with chronic active gastritis (CAG) and Reflux esophagitis in Nepalese adults.

**Keywords:** Chronic active gastritis, dyspepsia, *Helicobacterpylori*

## Introduction

*H. pylori,* is a Gram-negative pathogen that chronically infects at least 50% of the world's population; its annual incidence is more in developing countries in comparison to developed countries.[1] In developing countries, more than 80% of the population is H. *pylori* positive.[2]

The strong association of H. *pylori* with dyspepsia has caused a drastic change in the patient management.[3]

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Esophagogastroduodenoscopy (EGD) is usually performed due to persistent dyspeptic symptoms and/or presence of alarming symptoms for organic lesion. The vast majority of infections despite asymptomatic; have histological evidence of gastritis. The literature shows that H. *pylori* is associated with superficial chronic active gastritis, characterized by neutrophils in addition to lymphocytes and plasma cells.[4] Documented risk factors for H. *pylori* include low socioeconomic status, overcrowding, poor sanitation or hygiene, and living in a developing countries.[5]



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## Materials and Methods

This was a cross sectional study carried out at National Academy of Medical Sciences (NAMS) from Oct 2014 to Jan 2015. The study was approved by Institutional Review Board (IRB) of NAMS. We included patients who were age 18 years and/or older who presented to Gastroenterology outpatient clinic at NAMS, Bir hospital with symptoms of dyspepsia. An informed written consent was taken from all participants. Demographic data was collected in a questionnaire prepared for the study.

We have excluded patients who did not give consent for study, on histamine-2 receptor blockers, sucralfate and non-steroidal anti-inflammatory drugs, who had severe co-morbid conditions including respiratory disorders, recent MI, shock, patients with upper gastrointestinal bleeding, history of partial gastric resection, and normal EGD finding.

An upper gastrointestinal endoscopic examination was performed with a FUJINON scope after an overnight fasting and stopping PPI for 4 weeks. EGD was performed by an expert endoscopist.

A biopsy was taken from antrum, body and fundus preserved in formalin and sent for histopathological analysis. Sections were stained with routine Haematoxylin and Eosin for detection of H. *pylori* and gastritis. Giemsa stain was also used for better yield of H.*pylori* infection. Slides were examined microscopically for H. *pylori* by the Pathologist. Presence of H. *pylori* was regarded as positive while absence was regarded as negative. A histopathological finding of chronic active gastritis was also noted.

All data were entered in Microsoft EXCEL and analyzed by SPSS 16 (Statistical Package for Social Sciences) software.

Continuous data were expressed as mean and standard deviation whereas categorical data were expressed as number (percentage). Continuous data were analyzed using *t*-test and categorical data were analyzed using Chi-square test.

## Results

Among the 113 participants who underwent EGD, there were 62 male and 51 female; mean age of the patients was 36.4 years with age ranging between 16 and 88 years. Seventeen patients were excluded from the study due to presence of normal findings on EGD. All patients underwent EGD and simultaneous biopsy for detection of presence or absence of H. *pylori* based on histopathological studies. The flow chart of the study population is shown in Figure 1.

Of 27 (23.9%) patients infected by H. *pylori*; 17 (63%) were male and 10 (37%) were female. The infection by H.*pylori* did not differ significantly between males and females ($P = 0.33$). The age and sex of the patient cohort are shown in Table 1. Most of the patients presented with the symptoms of burning abdominal

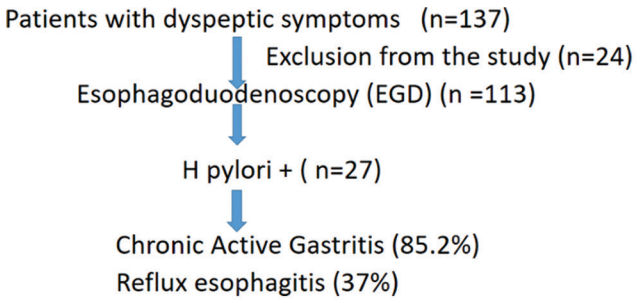


**Figure 1:** Showing flow chart of the study populations

sensation, additionally the symptoms were not statistically different among the H.*pylori* positive and H. *pylori* negative group as shown in Table 2.

The most common endoscopic findings was erythematous antral gastritis (40.7%) followed by erosive gastritis 34 (30.1%), pangastritis 10 (8.8%), duodenal ulcer 13 (11.5%), gastric ulcer 9 (8%) and erosive fundal gastritis 2 (1.8%) were detected. The endoscopic findings such as gastritis, gastric ulcer, duodenal ulcer were not significantly associated with H. *pylori*. Ten (37%) reflux esophagitis patients were H. *pylori* infected [Table 3].

A histopathological finding of chronic active gastritis (CAG) was observed in H. *pylori* infection. Patients who had H. *pylori* had significantly higher CAG (85.2%) as compared to H. *pylori* negative subjects ($P < 0.001$). The histopathological findings of the study patients undergoing EGD are shown in Table 4.

## Discussion

In our study, we documented the H. *pylori* infection of 23.9% which is in accordance with the report of 29.5% and 29.4% from the studies done by Rai *et al.* and Shrestha *et al.* respectively from Nepal.[6] The other studies from Nepal, however revealed the prevalence ranging between 16.3 and 70.5%.[7-12] H. pylori is a major pathogen of the gastrointestinal tract and it has been linked to a wide spectrum of gastric disorders, including gastritis, peptic ulcer, gastric cancer, and mucosa-associated lymphoid tissue lymphoma.[13,14] However, the infection remains latent in the majority of infected patients, and only few of them with H. pylori infection develop the disease and its complications.[15]

Makaju *et al.* in a dyspeptic patient observed a prevalence of 33.9%, which is slightly higher as compared to our study, however their study was a decade older and current prevalence might be decreased due to excellent diagnostic modality resulting in earlier treatment as well as empirical therapy in our populations.[11] A study from Turkey by Ceylan *et al.* also observed a very similar prevalence of 23.6% similar to present study.[16]

These data indicates that currently the prevalence of H. *pylori* infections in developing nations may not be very high as was

reflected from some of the older studies. A significantly higher rate of infection in an urban population (78.8%) than in a rural population (69.2%), have been reported by Kawasaki *et al.* from Nepal.[17,18]

The prevalence of H. *pylori* infection varies between different countries, as well as different geographic area within the same country. It had shown that age and socioeconomic status of the patients also plays a significant role in infection.[19]

Our study is also consistent with Shrestha *et al.,* Fraser *et al.* and Begue *et al.* findings without any difference in age and gender of H. *pylori* infection.[6,20,21]

A significant proportion of patients (37%) presenting with dyspepsia had reflux esophagitis in our study which is higher than Song *et al.* study (18.8%) from Korea[22] The higher prevalence in our study could be attributed to majority of patients with gastritis linked to antral parts of the stomach resulting in excess of acid secretion. However, we did not stratify the reflux esophagitis as per Los Angeles classification in our study, but a study from our same hospital (NAMS) by Kasyap *et al.,* reported grades of esophagitis as follows: grade A 31.8%, grade B 39.4%, grade C 33.8% and grade D 4.9%.[23]

In our study, CAG was significantly associated with the presence of H. *pylori* infection. Our finding of histo-pathological association with H. *pylori* infections is also consistent with two other studies from Nepal by Dhakhwa *et al.* and Thapa *et al.,* as well as very similar results by Schultz *et al.*, who showed 87% cases had chronic active gastritis observed in H. *pylori* infected person.[6,8,24]

As H. *pylori* infection is very common;[1,2] especially in the developing nations; patients with symptoms of dyspepsia tend to visit the family physicians or primary care doctors and are subsequently referred to the specialist in case of H. *pylori* complications such as hematemesis, gastric cancer etc., Hence, the knowledge and awareness of this infection is equally important in general practice. Also we did not use the special stains for H. *pylori* detection keeping in mind of its limitations in the resource limited settings like ours. Unfortunately, poor patients cannot afford to pay for the multiple H. *pylori* tests such as stool for antigen test or urea breath test in order to confirm the diagnosis. In this situation, the histological evidence of CAG alone based on hematoxylin and eosin (H and E) and Giemsa stain may be used to treat H. *pylori* infections regardless of

**Table 1: Age and sex distribution of the study population**

| Characteristics | All patients (*n*=113) | *H. Pylori* (+) (*n*=27) | *H. Pylori* (-) (*n*=86) | *P* |
|---|---|---|---|---|
| Age, mean years (%) | 36.4 (16-88) | 38.1 (18-71) | 35.9 (16-88) | 0.460 |
| Age group | | | | |
| < 65 | 110 (97.3) | 25 (92.6) | 85 (98.8) | 0.782 |
| > 65 | 3 (2.7) | 2 (7.4) | 1 (1.2) | |
| Sex | | | | |
| Male | 62 (54.9) | 17 (63.0) | 45 (52.3) | 0.333 |
| Female | 51 (45.1) | 10 (37.0) | 41 (47.7) | |

**Table 2: Spectrum of Clinical manifestation of the study population**

| Clinical manifestation | All Patients (*n*=113) | *H. Pylori* (+) (*n*=27) | *H. Pylori* (-) (*n*=86) | *P* |
|---|---|---|---|---|
| Bloating *n* (%) | 39 (34.5) | 13 (48.1) | 26 (30.2) | 0.086 |
| Belching *n* (%) | 36 (31.8) | 9 (33.3) | 27 (31.4) | 0.850 |
| Regurgitation *n* (%) | 30 (26.5) | 9 (33.3) | 21 (24.4) | 0.360 |
| Burning *n* (%) Sensation | 65 (57.5) | 18 (66.7) | 47 (54.7) | 0.271 |
| Nausea *n* (%) | 36 (31.9) | 11 (40.1) | 25 (29.1) | 0.256 |
| Vomiting *n* (%) | 11 (9.7) | 4 (14.8) | 7 (8.1) | 0.307 |

**Table 3: Esophagogastroduodenoscopy (EGD) findings of the patients**

| EGD findings | All Patients (*n*=113) | *H. Pylori* (+) (*n*=27) | *H. Pylori* (-) (*n*=86) | *P* |
|---|---|---|---|---|
| Erythematous Antral Gastritis *n* (%) | 46 (40.7) | 8 (29.6) | 38 (44.2) | 0.179 |
| Reflux Esophagitis *n* (%) | 26 (23.0) | 10 (37.0) | 16 (18.6) | 0.047 |
| Erosive Gastritis *n* (%) | 34 (30.1) | 9 (33.3) | 25 (29.1) | 0.673 |
| Pangastritis *n* (%) | 10 (8.8) | 2 (7.4) | 8 (9.3) | 0.762 |
| Gastric Ulcer *n* (%) | 9 (8.0) | 4 (14.8) | 5 (5.8) | 0.132 |
| Duodenal Ulcer *n* (%) | 13 (11.5) | 5 (18.5) | 8 (9.3) | 0.190 |
| Erosive Fundal Gastritis *n* (%) | 2 (1.8) | 1 (3.7) | 1 (1.2) | 0.382 |

**Table 4: Histopathological examination (HPE) findings**

| HPE findings | All Patients (*n*=113) | *H. Pylori* (+) (*n*=27) | *H. Pylori* (-) (*n*=86) | *P* |
|---|---|---|---|---|
| Gastric Carcinoma *n* (%) | 3 (2.7) | 1 (3.7) | 2 (2.3) | 0.700 |
| Chronic Active Gastritis *n* (%) | 46 (40.7) | 23 (85.2) | 23 (26.7) | <0.001 |
| Metaplasia *n* (%) | 11 (9.7) | 4 (14.8) | 7 (8.1) | 0.307 |

H. *pylori* seen histologically.[8,24] This finding is also supported by our study and CAG may be used as a surrogate marker of H *pylori* infections.

Due to the use of over the counter antibiotics; the resistance of H *pylori* has been increasing for Clarithromycin and Metronidazole. So, the updated guidelines for the treatment of this infection are pivotal in reducing the emerging marcolide resistance. The American college of Gastroenterology (ACG) guideline and the Toronto Consensus (2016) advocate for a longer duration of treatment (14 days for almost all regimens).[25,26] Either the Bismuth based quadruple therapy or the use of sequential treatment as a first-line therapy has been endorsed by these guidelines.

Patients should be asked about their previous exposure of antibiotic and this information should be bear in mind for the decision-making process while choosing a treatment regimen for H. *pylori*.

## Conclusions

Reflux esophagitis and CAG are commonly associated with H. *pylori* infections and the observations of CAG alone in a patient undergoing EGD for dyspepsia may be treated with anti- H. *pylori* therapy without further evidence of H. *pylori* infection, especially in the resource limited settings.


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## Conflicts of interest

There are no conflicts of interest.

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