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Original Research Article

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

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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 gastrodudenoscopy 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 gastrodudenoscopy, 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 gastrodudenitis; 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 • gastroscopy • *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

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communities with high *H. pylori* prevalence, empirical treatment could be more practical then 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 gastrodudenoscopy 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 gastrodudenoscopy from 1st of January 2015 to 30th of June 2017.

Inclusion criteria:

All patients who underwent gastrodudenoscopy for various upper GI symptoms and had histopathological examination of antral gastric mucosa were included in the study. GI symptoms for which gastrodudenoscopy 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 gastrodudenoscopy and histopathology:

Gastrodudenoscopy 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.

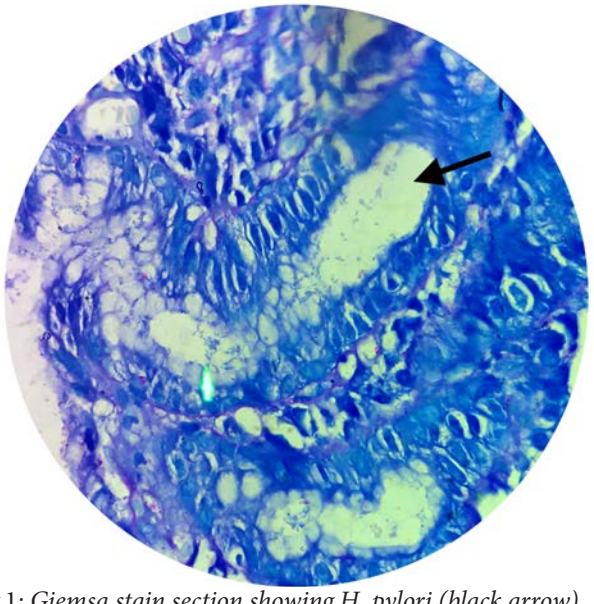

Fig 1: *Giemsa stain section showing H. pylori (black arrow) in clumps (1000x)*

Base line data were obtained and the demographics, indications, and histopathological findings were recorded. Data were entered in Microsoft Excel™. Data analysis was carried out using statistical package for social sciences, version 21 (SPSS™ Inc. Chicago, IL, USA). Descriptive results were presented as mean, standard deviation, frequency, and percentage. Association between categorical independent variables and outcome variable was analyzed using *Pearson Chi-square* test or *Fisher exact* test. *T-test* was done to compare mean of two groups. *P* value of less than 0.05 was deemed statistically significant.

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)*

		***H. pylori* infection**	
		Present	Absent
Gender	Male	34 (25.2%)	101 (74.8%)
	Female	29 (24%)	92 (76%)

X^2 = 0.05, p = 0.82

The age range of patients undergoing gastrodudenoscopy 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.

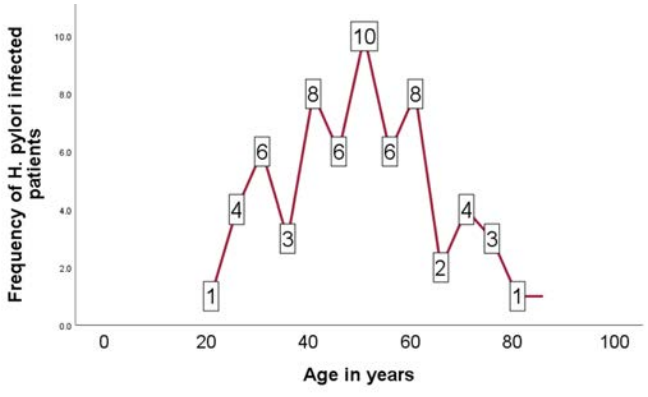

Fig 2: *Frequency curve of H. pylori infected patients for age*

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 only found to be significantly associated with *H. pylori* infection (p = 0.006).

Most common histopathological diagnosis were gastritis (n = 158, 61.7%) followed by gastrodudenitis (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)*

Clinical Symptoms		***H. pylori*** Positive *n* (%)	***H. pylori*** Negative *n* (%)	**Stats**
Dyspepsia	present	11 (18)	50 (82)	X^2 = 1.9
	absent	52 (26.7)	143 (73.3)	p = 0.17
Dysphagia	present	0	8(100)	p = 0.2*
	absent	63 (25.4)	185 (74.6)	
Heart burn	present	28(23.3)	92 (76)	X^2 = 0.2
	absent	35 (25.7)	101 (74.3)	p = 0.66
Vomiting	present	16 (30.2)	37 (69.8)	X^2 = 1.1
	absent	47 (23.2)	156 (76.8)	p = 0.29
Gastro Intestinal Bleeding	present	7 (63.6)	4 (36.4)	p = 0.006*
	absent	56(22.9)	189 (77)	
Loss of Appetite/ Wt loss	present	1(33.3)	2 (66.7)	p = 0.57*
	absent	62 (24.5)	191 (75.5)	

** - Fisher Exact; Stats - statistics*

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

Histopathological Findings		***H. pylori*** positive *n* (%)	***H. pylori*** negative *n* (%)	**Stats**
Gastritis	present	38 (24.1)	120 (75.9)	X^2=0.07
	absent	25 (25.5)	73 (74.5)	p=0.79
Esophagitis	present	3 (33.3)	6 (66.7)	p=0.69*
	absent	60 (24.3)	187 (75.7)	
Duodenitis	present	5 (29.4)	12 (70.6)	p=0.57*
	absent	58 (24.3)	181 (75.5)	
Duodenal ulcer	present	2 (66.7)	1 (33.3)	p=0.15*
	absent	61 (24.1)	192 (75.4)	
Gastric ulcer	present	2 (40)	3 (60)	p=0.59*
	absent	61 (24.3)	190 (75.7)	
Normal	Present	2 (40)	3 (60)	p=0.59*
	Absent	61 (24.3)	190 (75.7)	
Gastro-Duodenits	Present	10 (20)	40 (80)	X^2=0.71
	Absent	53 (25.7)	153 (74.3)	p=0.4
CA - Oesophagus	Present	0	4 (100)	p=0.57*
	Absent	63 (25)	189 (75)	
CA Stomach	Present	1 (20)	4 (80)	p=1.0*
	Absent	62 (24.7)	189 (75.3)	

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

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 gastrodudenoscopy. 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 Jemilohun. 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 gastrodudenoscopy 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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