



## ORIGINAL RESEARCH ARTICLE

### PREVALENCE OF HELICOBACTER PYLORI INFECTION IN PATIENTS WITH PEPTIC ULCER DISEASE AT KATHMANDU MODEL HOSPITAL

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#### ABSTRACT

**Introduction:** Endoscopic rapid urease test is a simple and most widely used test to detect the presence of urease in the gastric mucosa. Many studies have reported prevalence of *H. pylori* infection in relation to age, gender and site of ulcer. Therefore, this study was designed to determine the prevalence and significance of *H. pylori* in peptic ulcer disease. **Methods:** A retrospective review was carried out for patients with peptic ulcer disease who had undergone upper GI endoscopy in Department of Internal Medicine at Kathmandu Model Hospital. The records from January 2013 to December 2017 were analyzed. Any patient with previously diagnosed peptic ulcer, history of active bleeding, cancer and incomplete records were excluded. Peptic ulcer associated with *H. pylori* was diagnosed on the basis of endoscopic rapid urease test. **Results:** Among the 418 diagnosed case of peptic ulcer disease by upper GI endoscopy from Jan 2013 to Dec 2017, 213 tested positive for *H. pylori* by rapid urease test. Among the positive cases, over a half were males patients. Majority (23.9%) of the patients were in the age group of 35-44 years. Prevalence of *H. pylori* in duodenal ulcer was 51.6% followed by combined gastro-duodenal ulcer (26.8%) and gastric ulcer (21.6%). *H. pylori* was significantly associated with duodenal ulcer ( $p < 0.0001$ ). **Conclusion:** This study demonstrated relatively high prevalence of *H. pylori* infection in patients with duodenal ulcer who had undergone upper GI endoscopy.

**Key words:** Duodenal ulcer, Gastric ulcer, Helicobacter pylori, Peptic ulcer, Rapid urease test.

#### INTRODUCTION

Peptic ulcer is usually caused by an infection with bacteria called *Helicobacter pylori* (*H. pylori*). *H. pylori* is a gram-negative micro-aerophilic bacterium identified by Barry Marshall and Robin Warren in 1982.<sup>1</sup> It infects the epithelial lining in the part of the small intestine just beyond the stomach (the duodenum). It is one of the world's most prevalent bacterial pathogens representing key etiological factor of peptic ulceration.<sup>2</sup> It is present in approximately one-half of the world's population. Unless treated, colonization of this bacterium usually persists lifelong.<sup>3</sup> All known gastric *Helicobacter* species are urease positive and highly motile through flagella.<sup>4</sup> Endoscopic rapid urease test (RUT) is a rapid, cheap and simple test with high sensitivity and specificity that detects the

presence of urease in or on the gastric mucosa.<sup>5</sup> Although the prevalence of *H. Pylori* infection has been decreasing in association with improved standards of living in developed countries, it is still common in the developing countries such as Nepal. The purpose of our study is, thus, to determine the prevalence of *H. pylori* infection with peptic ulcer disease in relation to age, gender and site of ulcer through endoscopic rapid urease test at Department of Internal Medicine in Kathmandu Model Hospital.

#### METHODS

A retrospective review of records of the patients who had undergone upper GI endoscopy in Department of Medicine at Kathmandu Model Hospital from January 2013 to December 2017 was conducted

and relevant data were collected. Total 418 cases of peptic ulcer disease were included in this study. Due necessary permission from the concerned department and IRC phect-NEPAL was obtained. Any patient with previously diagnosed peptic ulcer, history of active bleeding, cancer and incomplete records were excluded. Peptic ulcer associated with H. pylori was diagnosed on the basis of endoscopic rapid urease test. Endoscopic mucosal biopsy specimens were inoculated into the urea broth within 15 minutes after collection. The rinsed and endoscope used were disinfected with and rinsed by sterile saline before next use for prevention of bacterial contamination to other sites and false positive results. Positive test for H. pylori was shown by change in colour of the medium from yellow to

pink or red. The case was regarded as positive if the rapid urease test became positive. Data were entered in Microsoft Excel 2007 and analyzed using SPSS version 23. Chi-square test was utilized to compare between the results of the studied parameters among different patients groups. p-value less than 0.05 were considered to be significant.

## RESULTS

Among the total 418 diagnosed case of peptic ulcer disease by upper GI endoscopy from Jan 2013 to Dec 2017, 213 tested positive for H. pylori by rapid urease test.

**Table 1: Distribution of confirmed H. pylori infection in relation to gender and age groups (n=213)**

Age Group	H. pylori Infections		
	Male	Female	Total
	n (%)	n (%)	n (%)
15-24	13 (6.1)	16 (7.6)	29 (13.7)
25-34	19 (8.9)	25 (11.7)	44 (20.6)
35-44	28 (13.1)	23 (10.8)	51 (23.9)
45-54	21 (9.9)	17 (8.0)	38 (17.9)
55-64	24 (11.3)	7 (3.3)	31 (14.6)
65-74	12 (5.6)	5 (2.3)	17 (7.9)
75-84	3 (1.4)	0 (0)	3 (1.4)
<b>Total</b>	<b>120 (56.3)</b>	<b>93 (43.7)</b>	<b>213 (100)</b>

The overall prevalence rate of H. pylori infection among patients with peptic ulcer disease was 50.9%. Among them, 56.3% (n=120) were males and 43.7% (n=93) were female patients. Majority of the

patients were in the age groups 35-44 years (23.9%) as shown in table 1. The mean age of the patients was 42.4 years.

**Table 2: Distribution of Peptic Ulcer Disease According to Location**

Location Of Ulcer	Frequency (N=418)			
	Present		Absent	
	n	%	n	%
<b>Gastric Ulcer</b>	98	23.4	320	76.6
<b>Duodenal Ulcer</b>	207	49.6	211	50.4
<b>Gastro-duodenal Ulcer</b>	113	27.0	305	73.0

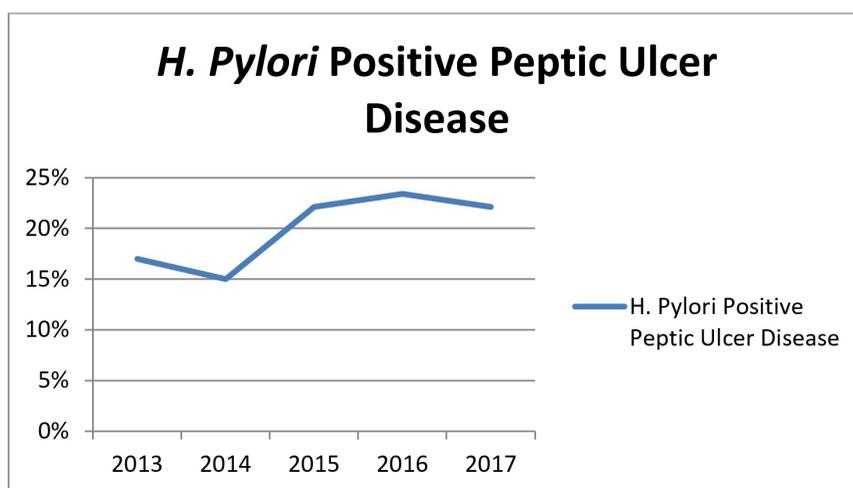
Table 2 shows the distribution of peptic ulcer disease according to location. Most common was duodenal ulcer n= 207 (49.6%) followed by combined gastro-

duodenal ulcer n=113 (27.0%) and gastric ulcer n=98 (23.4%).

**Table 3: Distribution of H. Pylori Positive Peptic Ulcer Disease According to Location**

Location Of Ulcer	Frequency (n=213)			
	Present		Absent	
	n	%	n	%
<b>Gastric Ulcer</b>	46	21.6	167	78.4
<b>Duodenal Ulcer</b>	110	51.6	103	48.4
<b>Gastro-Duodenal Ulcer</b>	57	26.8	156	73.2

Table 3 shows the distribution of H. Pylori positive peptic ulcer disease according to location. Most common was duodenal ulcer n=110 (51.6%) followed by combined gastro-duodenal ulcer n=57 (26.8%) and gastric ulcer n=46 (21.6%).



**Diagram 1: Five Year Distribution of confirmed H. pylori infection In Peptic Ulcer Disease**

Diagram 1 shows the distribution of H. pylori positive peptic ulcer disease in a span of five years (2013 – 2017) reporting 2016 to receive maximum cases of H. pylori positive peptic ulcer disease and 2014 to observe least numbers.

**Table 4: Association of H. pylori with different ulcer location**

Location Of Ulcer		Presence Of H. Pylori Infection	Absence Of H. Pylori Infection	Chi-Square	p-value
<b>Gastric Ulcer</b>	No	133	187	0.884	0.347
	Yes	46	52		
<b>Duodenal Ulcer</b>	No	69	142	17.785	<0.0001
	Yes	110	97		
<b>Both</b>	No	122	183	3.663	0.0556
	Yes	57	56		

Association of H.pylori according to different locations of ulcer was also evaluated. Patients with duodenal ulcer had high statistical significance (P<0.0001) in prevalence between presence of H. pylori and absence of H. pylori. Patients with combined gastro-duodenal ulcer had no significant difference (P=0.0556) in prevalence between presence of H. pylori and absence of H. pylori. Similarly, patients with gastric ulcer showed no any statistical significance (P=0.347).

## DISCUSSION:

Peptic ulcer disease is a common world-wide problem. It manifests as a break in the gastrointestinal mucosa that extend through the muscularis propria. It mainly occurs in the stomach and proximal duodenum. *H. pylori* infection is strongly associated with peptic ulcer disease.<sup>2</sup> In developing countries, such as Nepal, the prevalence generally may be related to socioeconomic status and levels of hygiene, no tea drinking habit and lesser frequency of meals.<sup>6</sup> Endoscopic rapid urease test (RUT) is generally preferred as it is a rapid, cheap, simple test which detects the presence of urease in or on the gastric mucosa. On the other hand, this test has generally high sensitivity and specificity.<sup>5</sup>

Male prevalence (n=120, 56.3%) of *H. pylori* positive peptic ulcer was found high compared to female (n=93, 43.7%) in this study. This finding was consistent with similar study done in Iraq which showed 54.55% of the patients were male and 45.45% of the patients were female.<sup>7</sup> However, the latter study was done in different setting and the sample size was relatively small compared to our study. The peak prevalence of *H. pylori* infection in this study was 35-44 years which consisted of 23.9% of confirmed *H. pylori* positive cases. Since, this study shows prevalence of *H. pylori* in middle age group patients, the reason could possibly be due to busy work schedule along with inappropriate and untimely food habits. The finding of this study was consistent with a similar study done in Thailand which showed *H. pylori* infection rate was peak in 30-49 years of age.<sup>8</sup> The result was comparable with similar study done in Saudi Arabia.<sup>9</sup>

In this study, the overall prevalence of *H. pylori* in peptic ulcer disease was 50.9%. Among the 213 confirmed cases of *H. pylori* infection, higher prevalence was found in patients with duodenal ulcer (n=110, 51.6%) compared with gastric ulcer (n=46, 21.6%) and gastro-duodenal ulcer (n=57, 26.8%). In the study done by Mitipat et al<sup>10</sup>, the overall prevalence of *H. pylori* infection in peptic ulcer disease by rapid urease test was 49.1%. Among them, duodenal ulcer patients (75%) were significantly higher than gastric ulcer patients (56.4%) and patients with gastritis (44.1%). Shrestha et al<sup>11</sup> also reported that overall prevalence of *H. pylori* infection was 50.47%. These data indicates

that *H. pylori* is an etiological agent for half of the cases of peptic ulcer disease and prevalence of *H. pylori* infection is significantly high in duodenal ulcer compared to gastric and combined gastro-duodenal ulcer.

Findings in this study showed duodenal ulcer was significantly associated with *H. pylori* infection (p-value <0.0001). However, there was no association with gastric ulcer disease and combined gastro-duodenal ulcer (p-value =0.347 and =0.0556). This was consistent with similar other study.<sup>12</sup> Shrestha et al also reported that duodenal ulcer was significantly associated with *H. pylori* infection (p-value <0.032).<sup>10</sup>

## CONCLUSION:

Our study demonstrated relatively high prevalence of *H. pylori* infection in patients with peptic ulcer disease who had undergone upper GI endoscopy. *H. pylori* infection is significantly associated with duodenal ulcer in comparison to gastric ulcer and combined gastro-duodenal ulcer. Middle aged patients are at risk of developing *H. pylori* infection and male prevalence of *H. pylori* infection is comparatively greater compared to female patients.

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