Prevalence of helicobacter pylori in Dhulikhel Hospital, Kathmandu University Teaching Hospital: A retrospective histopathologic study

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Abstract

Objective: The main objective of this study was to determine prevalence of *Helicobacter pylori* infection in Dhulikhel Hospital, Kathmandu University Teaching Hospital.

Methodology: Endoscopic antral biopsies from January 1, 2004 to August 31, 2005 were studied retrospectively. Hematoxylin and eosin and Giemsa stained histological sections were examined.

Results: Out of 224 patients (Male 125 and female 99) who underwent endoscopic biopsy and included in the study, a total of 76 (33.9%) patients (Male 50 and female 26) were infected by H. pylori. The mean age of the H. pylori infected patients was 40.2 years (SD 16.0). The infection by H. pylori was significantly higher in males than females (p<0.05) with male to female ratio of 1.9:1. The most common (31.3%) histopathologic finding was chronic superficial gastritis followed by normal histology (30.8%). A total of 10 cases (4.5%) of adenocarcinoma and 16 cases (7.1%) of intestinal metaplasia were detected and neither of them showed presence of H. pylori. Two cases (0.9%) were diagnosed as suspected malignancy and both were negative for H. pylori infection. Among gastritis, H. pylori was most frequently observed in chronic active gastritis (86.1%). Two of 69 cases (2.9%) of normal gastric mucosa showed H. pylori.

Keywords: *Helicobacter pylori*, gastritis, endoscopy, prevalence, Nepal

The high incidence of gastritis in Nepal is a conventional clinical wisdom. This common clinical entity imposes a high burden on scanty public and private health resources. *Helicobacter pylori* is a well recognized etiologic agent of gastritis and its association was established first in 1983 by two Australians Barry Marshal and Robin Warren who cultured the organism from gastric biopsy specimen taken from symptomatic patient.[1]

H. pylori has been regarded as a major etiologic factor of peptic ulcer disease in 1994 by National Institutes for Health (NIH) Consensus Development Conference Pannel.[2]

H. pylori is a ubiquitous gastrointestinal organism which infects more than half the population of the world.[3] In First World countries, it infects 25%–40% of the population, with the infection generally becoming less common as standards of living rise. However, in developing countries, *H. pylori* infects most of the population, so that most people in Eastern Europe, Asia, Africa and South America are carriers.[4] In Nepal, association of *H. pylori* has been found in significantly higher number of duodenal ulcer, gastric ulcer and gastritis cases by various studies.[5,6]

Our present study aims to find out prevalence of *H. pylori* in patients suspected of acid peptic disease who underwent endoscopic biopsy in Dhulikhel Hospital, Kathmandu University Teaching Hospital, Nepal.

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Materials and methods

A total of 274 endoscopic biopsy samples from January 1, 2004 to August 31, 2005 (20 months period) obtained from patients suspected of having acid peptic disease at Dhulikhel Hospital, Kathmandu University Teaching Hospital (KUTH), Nepal were studied. At least two gastric biopsies from suspicious parts of the antrum were obtained from each patient for the histological examination. Using the following exclusion criteria, 224 cases were included in the study:

- Biopsy containing only necrotic tissue
- Tissue obtained only from the ulcer sites
- All follow up endoscopic biopsies

Specimens were fixed in 10% neutral buffer formalin and processed by the usual processing (alcohol dehydration, clearing and paraffin embedding) in automatic tissue processor using an overnight schedule for 16-18 hours. Blocks were prepared in paraffin wax and sections were cut into 3-4 micrometer. Then sections were stained by Hematoxylin and Eosin and Giemsa stains in all cases. Hematoxylin and Eosin stained sections were observed for identification of different pathologies of gastric mucosa. Giemsa stained sections were observed for *H. pylori*. *H. pylori* was considered as positive when spiral or curved organism was present on superficial mucosal layer or deeper crypt layer. No *H. pylori* was seen within the gastric glands.

To make data more simple and meaningful, cases of gastritis were divided into chronic gastritis with and without activity depending upon presence or absence of neutrophilic infiltration. Accordingly chronic gastritis with activity included chronic active gastritis and chronic active gastritis with intestinal metaplasia. Likewise chronic gastritis without activity included chronic superficial gastritis and chronic gastritis with intestinal metaplasia. Intestinal metaplasia was diagnosed when the gastric epithelium showed

evidence of intestinal type of epithelium, i.e. unequivocal presence of goblet cells.

No grading of *H. pylori* and severity of gastritis was performed because the aim of this study was not to determine the severity of gastritis and *H. pylori*.

Data were tabulated and analyzed by using *SPSS 11.0 for windows*. The statistical significance between male and female with *H. pylori* infection, and chronic gastritis with and without activity with *H. pylori* infection were analyzed by chi-square test.

Results

A total of 76 (33.9%) patients (Male 50 and female 26) were infected by *H. pylori* out of 224 patients (male 125 and female 99) who underwent endoscopic biopsy.

Profile of histopathologic findings of endoscopic examination of 224 cases with *H. pylori* infection status is shown in table 1. Most common finding was chronic superficial gastritis followed by normal histology. A total of 10 cases of adenocarcinoma and 16 cases of intestinal metaplasia were detected and neither of them showed presence of *H. pylori*. Two cases were diagnosed as suspected malignancy. Both were negative for *H. pylori* (Table 1).

The mean age of the *H. pylori* infected patients was 40.2 years (SD 16.0). *H. pylori* infection was most commonly observed in age group of 10-20 years (Table 2).

The prevalence of *H. pylori* infection in the male is significantly higher (P<0.05) than in female (Table 3).

Out of 224 cases, a total of 126 cases (56.25%) showed gastritis. When *H. pylori* infection was compared between gastritis with activity it was observed most frequently (78.3%) in chronic active gastritis (Table 4).

Table 1: Distribution of *H. pylori* infection according to gastric pathology (n=224)

Diagnosis	H. pylori		Total n (%)
	Positive n (%)	Negative n (%)	
Chronic active gastritis	31 (86.1)	05 (13.9)	36 (16.0)
Chronic active gastritis with intestinal metaplasia	05 (50.0)	05 (50.0)	10 (04.5)
Chronic superficial gastritis	35 (50.0)	35 (50.0)	70 (31.3)
Chronic superficial gastritis with intestinal metaplasia	03 (30.0)	07 (70.0)	10 (04.5)
Intestinal metaplasia	00	16 (100.0)	16 (07.1)
Suspicious for malignancy	00	02 (100.0)	02 (00.9)
Adenocarcinoma	00	10 (100.0)	10 (04.5)
Normal gastric mucosa	02 (02.9)	67 (97.1)	69 (30.8)
Acute gastric ulcer	00	01 (100.0)	01 (00.4)
Total	**76**	**148**	**224**

Table 2: Age wise distribution of *H. pylori* infected cases (n=76)

Age group (years)	Total n (%)	Positive n (%)
10-20	16 (07.1)	07 (43.7)
21-30	63 (28.1)	24 (38.0)
31-40	51 (22.7)	17 (33.3)
41-50	44 (19.6)	12 (27.3)
51-60	21 (09.4)	08 (38.0)
61-70	13 (05.8)	03 (23.0)
71-80	15 (06.7)	05 (33.3)
81+	01 (00.4)	00
Total	**224**	**76 (33.9)**

Table 3: Sex wise distribution of *H. pylori* infected cases (n=76)

		H. pylori		Total n	P- value
		Positive n (%)	Negative n (%)		
Sex	Male	50 (40.0)	75 (60.0)	125	**0.03**
	Female	26 (26.3)	73 (73.7)	99	
Total		**76**	**148**	**224**	

Table 4: Distribution of *H. pylori* in gastritis according to activity (n=126)

Diagnosis / *H. pylori*	Positive n (%)	Negative n (%)	Total n	P-value
Chronic gastritis with activity	36 (78.3)	10 (21.7)	46	
Chronic gastritis with no activity	38 (47.5)	42 (52.5)	80	0.001
Total	74	52	126	

Discussion

Our study showed that 33.9% of the total patients were infected with *H. pylori*. The bacterial infection is commonly acquired in early childhood in developing countries and unless treated remains for life.[7] The over all total prevalence of *H. pylori* infection (33.9%) in our present study is lower than those of the other studies (49%-70%) done in and outside Nepal.[5,6,7,8] The lower prevalence in our study could be due to low number of biopsy material taken in each case. Guzman *et al* from Costa Rica observed that the organism in the stomach distributed

patchily giving rise to high rate of false positive and false negative results in their rapid urease test.[9] Thus, *H. pylori* may be present in one biopsy and absent in another from the same patient. Taking several pieces of tissues from different representative areas minimize this situation. A declining prevalence of *H. pylori* infection has been reported in the west as well as in Japan.[10,11] In a study done in Nepal by Shakya *et al* in 1998 showed high prevalence rate (80%) of *H. pylori* infection. This may be due to very low number of samples included on their study as compared to our present study.[6] In another study done in Dolpa district of Nepal by Nathalie *et al* in 1998 reported low prevalence (11.3%) of *H. pylori* infection by detecting anti-*H. pylori* IgG in saliva.[12] This low prevalence in their study could be due to difficulty in transportation of samples from remote areas of Nepal for testing them in Europe. More importantly, serological test to detect antibody in saliva is not very sensitive test because of low concentration of antibodies in the saliva.[13] In 1998 Kawasaki *et al* reported significant regional variation in prevalence of *H. pylori* infection within Nepal.[14] Therefore, the lower rate of prevalence in our present study could be either due to actual reduction in prevalence of *H. pylori* infection or due to regional variation.

In our present study *H. pylori* infection is more common in young age group (10-20 years). This could be due to acquisition of *H. pylori* being common in the childhood.[7] This higher prevalence of *H. pylori* in this age group is almost similar to that reported by others.[5] However, Boixeda *et al* reported high prevalence of *H. pylori* infection at 4th and 5th decades of life.[15] In our study also the second most common age group is 21- 30 and 51-60 years. Thus, our finding is similar to those observed by others in that *H. pylori* infection acquires in early childhood and increases significantly with age.[14,]

Our present study showed significantly higher *H. pylori* infection in males than in females (p<0.05) with male to female ratio of 1.9:1. However, studies done by others did not show any significant gender difference.[5,14,16] The cause of male predominance in our study is not clear. Being a retrospective study the different factors that may contribute in causation of *H. pylori* infection were not speculated. Furthermore, prospective study in large scale is required to establish the cause of male predominance in *H. pylori* infection.

In chronic gastritis, infiltration of neutrophils in surface and foveolar epithelium indicates that the gastritis is active and known as "chronic active gastritis". In such cases *H. pylori* is abundant and can

be seen easily.[18] Our present study also showed higher prevalence of *H. pylori* in gastritis with activity (78.3%) as compared to gastritis without activity (47.5%). This finding is similar to the findings of study done by others.[7,19]

Neither intestinal metaplasia nor adenocarcinoma cases showed *H. pylori* infection. However, some cases of intestinal metaplasia with chronic active gastritis and chronic superficial gastritis revealed *H. pylori*. This decreasing tendency of *H. pylori* in gastritis with intestinal metaplasia and absence of organism in areas of intestinal metaplasia is due to the change in microenvironment of gastric mucosa where the organisms are eliminated.[18] Some authors have reported that intestinal metaplasia remains unchanged following treatment whereas others have reported a reduction.[20,21]

Two out of 69 (2.9%) normal gastric biopsy showed *H. pylori* in our study. Other studies done in Nepal have also shown presence of *H. pylori* in varying proportion in normal gastric mucosa.[5,6] Therefore it is not surprising to come across a few *H. pylori* positive cases in normal gastric mucosa.

Being a retrospective study, the limitation of our present study includes lack of information regarding presence or absence of gastric or duodenal ulcer in the patients. Our study might have been enhanced if there had been detailed information about clinical symptoms, health status and social history such as educational background, socioeconomic status and dietary habit. Also, study was hospital based and patients were selected as per decision of physician and may not represent the community.

Unlike most other Nepalese studies, a large number of cases were included to detect prevalence of *H. pylori* infection. This allowed patients of all ages, including sufficient number of young children.

In conclusion our findings have some important implications. The high prevalence of *H. pylori* infection in chronic active gastritis addressed the need of anti *H. pylori* therapy even in *H. pylori* negative chronic active gastritis cases. Tissue containing only intestinal metaplasia has no role in decision making on treatment. Therefore multiple tissue bits must be taken to observe gastritis and *H. pylori* from the various areas away from intestinal metaplasia, which has more useful clinical implication.

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