

Frequency of *Helicobacter pylori* in biopsy proven gastritis and its association with lymphoid follicle formation

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Abstract

Objective: To determine the frequency of *H. pylori* infection in biopsy proven gastritis and its association with lymphoid follicle formation.

Methods: This was a cross sectional study conducted at the Department of Histopathology, Dow Diagnostic Reference and Research Laboratory between January 2008 and December 2009. Analysis of 185 gastric antral biopsy specimens was done. Tissue sections were stained with haematoxylin and eosin for histological examination for severity of gastritis and lymphoid follicle formation. Giemsa stain was used for *H. pylori* assessment.

Results: Out of 185 cases, *H. pylori* was found in 114(61.6%) patients. Frequency of *H. pylori* infection was seen in fourth and fifth decades as 17.8% and 15.1% respectively. A total of 51(27.6%) cases in which lymphoid follicle formation was found, 44(38.6%) were associated with *H. pylori* infection. This association was statistically significant (p value <0.0005) by using Chi square test.

Conclusion: The frequency of *H. pylori* infection is common in our population, moreover, significant association is seen between lymphoid follicle formation and *H. pylori* infection.

Keywords: *H. Pylori*, Lymphoid follicle, Giemsa stain, Primary gastric B-cell lymphoma (JPMA 61:138; 2011).

Introduction

Helicobacter pylori (*H. pylori*) infection is chronic and common throughout the world, with a higher prevalence in developing than in developed countries.¹ *H. pylori* infection causes gastritis and is the most important risk factor for peptic ulcer disease (gastric and duodenal)² and it also contributes to the onset of gastric cancer and primary gastric B-cell lymphoma.³

H. pylori is present in a significant number of dyspeptic patients with endoscopically normal stomach.⁴ A strong relationship is also documented between *H. pylori* and peptic ulcer disease. However, it is more common in duodenal ulcer than gastric ulcer and its frequency increases with the increasing age.⁵ The incidence of *H. pylori* infection in the patients with gastroesophageal reflux disease varies widely in literature from 3% to 90% and with

approximately a consensus of 35% in most series.⁶ The normal gastric mucosa contains very few lymphocytes in the lamina propria. Lymphoid follicles and aggregates are characteristic of *H. pylori* associated gastritis. Lymphoid follicle prevalence between 27.4% and 100% have been reported in gastric mucosa from patients with *H. pylori* associated gastritis,⁷ but this association becomes weaker in adults with chronic non-active, particularly atrophic gastritis.⁸ In the light of existing literature it is seen that *H. pylori* infection is associated with the severity of gastritis followed by gastric malignancies and primary gastric B cell lymphoma.⁹

There is a dearth of literature regarding the association of *H. pylori* gastritis with lymphoid follicle formation, in studies done at a National level. Therefore this study aimed to determine the frequency of *H. pylori* in gastritis and its association with lymphoid follicle formation.

Methodology

During the period of January 2008 and December 2009, 200 consecutive gastric antral biopsy samples were included because it provides useful information regarding the *H. pylori* status.¹⁰ The study was approved by the ethical review board of Dow University of Health Sciences. After reviewing all the slides, 15 cases were excluded from the study, of which nine cases had inadequate material, three were diagnosed as antral polyps and three were those of adenocarcinoma. Finally 185 cases were included in this prospective study at the Department of Histopathology, Dow Diagnostic Reference and Research Laboratory (DDRRL). The clinical data was analyzed for patient's age and gender. All gastric biopsy specimens for histological examination were fixed in 10% formalin, embedded in paraffin wax and cut into 4 µm thick sequential sections. All tissue sections were stained with haematoxylin and eosin to document histological examination for severity of gastritis in terms of inflammation, according to Sydney system¹¹ and lymphoid follicle formation. Giemsa stain was used for further *H. pylori* assessment.¹² All gastric specimens were evaluated independently by three histopathologists and finally a consensus was made on the multihead microscope for the equivocal cases.

The data was analyzed by using SPSS version 16. Frequencies and percentages were computed for the categorical variables like age, gender, *H. pylori*, severity of gastritis and lymphoid follicle formation. χ^2 test was applied to determine the association of lymphoid follicle formation with *H. pylori* gastritis.

Results

A total of 185 cases were studied, out of which

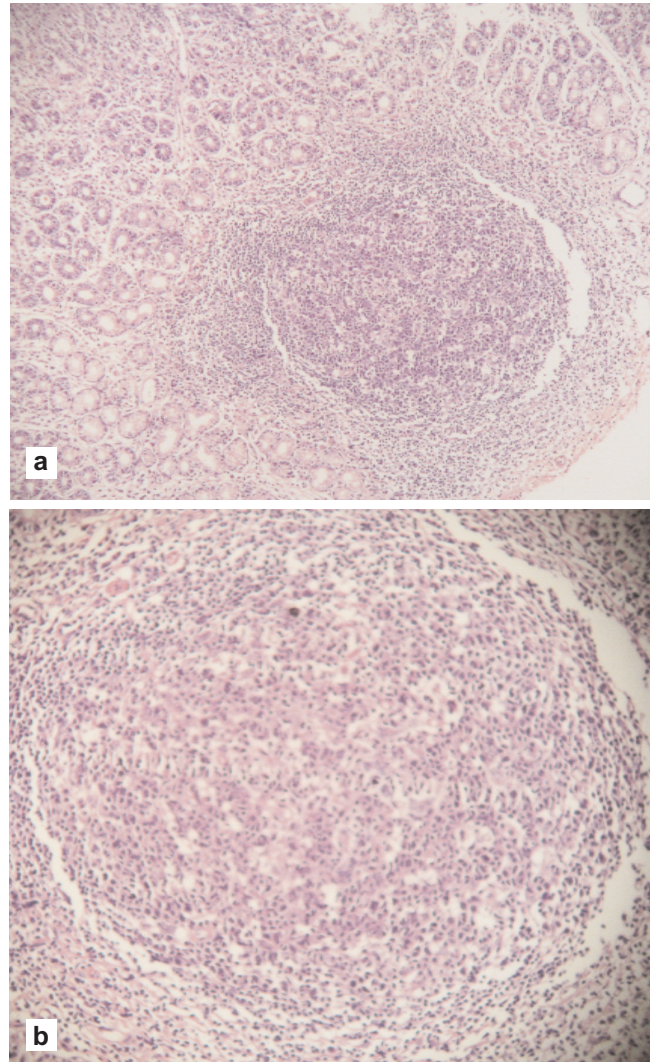


Figure: (1a)- Moderate chronic gastritis with lymphoid follicle at low power view. (1b)- lymphoid follicle at high power view.

114(61.6%) patients were positive for *H. pylori* and 71(38.37%) were negative. Out of 185 patients, 105(56.8%) were male with mean age of 39.6 ± 13.2 years and 80(43.2%) female with mean age of 39.1 ± 15.2 years. In males the frequency of *H. pylori* was found to be 69(65.7%) while in females 45(56.2%).

High frequency of *H. pylori* infection was seen in third, fourth and fifth decades that is 24.3%, 23.8% and 21.6% respectively. Out of 185 cases 45 showed mild chronic gastritis, 137 moderate chronic gastritis and 3 severe chronic gastritis. In mild chronic gastritis, *H. pylori* was seen in 20(17.5%) patients, while in moderate and severe chronic gastritis it was found in 92 (80.7%) and 2(1.8%) cases respectively. Out of 114 *H. pylori* positive cases 44 (38.6%) were associated with lymphoid

Table: The association of H. pylori with lymphoid follicle formation in antral biopsy specimens.

	Lymphoid follicle		Total
	Positive	Negative	
H. pylori positive	44*	70	114
	-38.60%	-61.40%	
H. pylori negative	7	64	71
	-9.90%	-90.10%	
Total	51	134	185
	-27.60%	-72.40%	

* P value <0.0005

follicle formation (Figure-1a & b.) which was statistically significant (p value <0.0005), whereas 70(61.4%) had no lymphoid follicle formation, as shown by Table.

When lymphoid follicles were assured with different grades of gastritis no significant association was seen (p=0.009 with 33.3% cell count).

Further, there was no significant association regarding age of the patient and lymphoid follicle formation (p=0.210).

Discussion

The distribution of H. pylori associated gastritis in Western society is well established¹³ and its incidence varies widely in literature from 30-90%.¹² While in our setup there are very few reports regarding its frequency. A local study conducted by Aftab Mohsin et al in hospital setting showed 43.6% frequency of H. pylori in gastritis.¹⁴ While in our study the frequency of H. pylori infection was found to be 61.6% which is quite comparable to a western study (59%).¹⁵ There are a number of methods for detecting H. pylori, including the breath test, the urease test and culture, but histological detection in a gastric biopsy is the commonest and among the most sensitive.¹⁶ Low prevalence of H pylori infection is seen in younger age groups as reported by Asaka et al, which is similar to that in other developed countries.¹⁷ These findings are consistent with our study as H. pylori infection is more common in middle aged adults. There can be little bias to this finding as number of paediatric patients is less in our study.

There was no significant association between H. pylori infection and age which is comparable to the findings of Aziz et al, however, this study was conducted in paediatric community.¹⁸

A study conducted by Karttunen et al showed that the number of H. pylori in the antral mucosa is significantly associated with the quantity of mononuclear inflammatory cells.¹⁵ Comparable with this study, we also found H. pylori in 82% cases of moderate chronic gastritis and two out of three cases of severe chronic gastritis were

H. pylori positive, whereas in mild gastritis lower frequency of H. pylori was seen.

Lymphoid follicles are a common feature of H. pylori associated gastritis.¹⁹⁻²¹ Lymphoid follicles may result from chronic antigenic stimulation in response to H. pylori infection, and therefore, present a specific immune response directed against H. pylori.^{19,20} The association between H. pylori, lymphoid follicle formation and gastric mucosa-associated lymphoid tissue (MALT) lymphoma is well established.^{22,23} We hardly found any local literature supporting the significant association of H. pylori gastritis with lymphoid follicle formation. In our reviews significant association between H pylori infection and lymphoid follicle formation was seen.

In the present study we did not find any significant association of lymphoid follicle formation with age and severity of gastritis similar to the study conducted by Genta et al²⁴ and dissimilar to Eidt et al where significant association was seen between severity of gastritis with lymphoid follicle formation.²⁵

The frequency of H. pylori infection in this study is quite similar to a western literature, whereas dissimilarity with existing local data generates the need for more studies and clinical insight with histological finding in this regard. Furthermore, the association of H. pylori with lymphoid follicle formation should be assessed in follow up studies to analyze the transformation of benign reactive process towards the lymphoma formation.

Conclusion

There is a significant association between H. pylori infection with lymphoid follicle formation, however lymphoid follicle formation is not associated with severity of gastritis and age of the patient in our population.

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