Original Article

To Determine the Frequency of H. Pylori Infection and its Association with Lymphoid Follicle Formation in Gastritis

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ABSTRACT

OBJECTIVE: To evaluate the frequency of H-pylori infection and lymphoid follicle formation in gastric biopsies.

METHODOLOGY: The presented study was a cross-sectional and performed in PNS Shifa hospital, Karachi from November 2013 to May 2014. Gastric biopsies of 122 patients of age between (15 to 65), male and female with complain of mild to severe gastritis were included, while patients on treatment or known case of carcinoma, inadequate, unfixed and crushed biopsies were excluded. Detail histopathological examination was carried out. The frequencies of H. pylori infection and lymphoid follicles formation were noticed along with the history of the patients.

RESULTS: In the present study, out of 122 cases, 46(37.70%)were between 15-40 years of age while 76 (62.30%) were in between 41-65 years of age, mean age was calculated as 44.39±12.29 years, 63(51.64%) were male and 59(48.36%) were females. Frequency of H-pylori infection and lymphoid follicles in gastric biopsies were calculated as 81(66.39%) and 49(40.16%) respectively. Significant association of H. pylori infection and lymphoid follicle formation was seen. (P-value= 0.03, by Chi-square test)

CONCLUSION: This study concludes that the frequency of H-pylori infection and lymphoid follicle formation (precursor of MALT lymphoma) in gastric biopsy is significantly associated and this study will help in early detection of positive cases for appropriate antibiotic therapy and H-pylori eradication therapy, thus saving the patient from developing MALT Lymphoma and other malignancies.

Keywords: H. pylori, Lymphoid follicle, MALT Lymphoma

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INTRODUCTION

The presence of H pylori infection may help to provoke mucosa-associated lymphoid tissue (MALT) lymphoma in chronic cases via alterations in gastric mucosal cell proliferation. The chronic infection induced by H pylori is usually reported to be carcinogenic due to its ability to promote the production of bioactive factors such as gastrin and somatostatin and hydrochloric acid. Moreover, Helicobacter pylori are also associated with non-ulcerdyspepsia, gastric adenocarcinoma and non-Hodgkin's lymphoma[1,2].

This is very important to have complete information about histopathological abnormalities regarding H-pylori induced chronic infections and follicle formation in clinical studies. The proper management of this pathology with drugs selected after sensitivity and resistance test help to eradicate the problem at initial stages hence prevent MALT Lymphoma development[3].

H-pylori, a causative organism of chronic active gastritis is classified as class 1 carcinogen by WHO.[4]The epidemiological features are common for H-pylori and gastric adenocarcinoma in different populations of the world[5].

Its prevalence is high in Pakistan, India and Bangladesh, varying from 55-92%[6]. A study conducted shows, rate of H-pylori positive gastritis is 44.7%[7]. Another study conducted at Karachi shows the prevalence of H.pylori induced infection 61.6% and lymphoid follicles were (38.6%) seen in H-pylori positive gastritis[8]. Western literature shows a well-established relationship of H.pylori induced gastritis, lymphoid follicles and MALT-lymphoma. Therefore, H.pylori induced gastritis leading to lymphoid follicle formation should be properly documented in our population, too.

The rationale of this study is to evaluate the frequency of H-pylori infection and lymphoid follicle formation as (precursor of MALT lymphoma) concerning the severity of gastritis by using updated Sydney scoring system as (mild, moderate and severe). This will help in early detection of positive cases for appropriate antibiotic therapy. H-pylori eradication therapy can save the patient from developing MALT Lymphoma and other malignancies[3].

METHODOLOGY

The present study was a cross-sectional study

conducted with 122 patients in the department of histopathology, PNS Shifa hospital Karachi from November 2013 to May 2014. The subjects aged between 15-65 years from both genders with mild to severe gastritis were included while inadequate biopsies and patients on treatment and known case of carcinoma were excluded from the study. The specimens for biopsy were preserved in 10% formalin and processed to prepare histological slides and routine stains were performed with hematoxylin and eosin (H and E) stain for the detection of H.pylori and formation of lymphoid follicles as per operational definition. To assure the presence of H. pylori, Giemsa staining was carried out. Microscopic evaluation was done by Consultant Histopathologist. Formal approval of the study from the hospital ethical committee was also sought. The data were analyzed by SPSS. Frequency/percentages for age, gender, H. pylori infection, lymphoid follicle formation and severity of gastritis were calculated. Chi-square test was used to revealed association of H. pylori infection and lymphoid follicle formation. P-value equals or less than 0.05 was considered significant.

RESULTS

According to the inclusion/exclusion criteria, 122 cases were enrolled to determine the presence of H-pylori infection and lymphoid follicle formation (precursor of MALT lymphoma) in gastric biopsies. Patient's age distribution was done which shows 46 (37.70%) were between 15-40 years of age while 76 (62.30%) were between 41-65 years of age, mean±SD was calculated as 44.39±12.29 years as shown in Figure I. In this study, we found that 43 H. pylori positive patients were middle-aged adult (41-65 years old) which was more as compared 38 H. pylori-infected patients were young adults (15-40 years old) and, the p-value was calculated as 0.003. Among 81 H.pylori positive cases 51(63.64%) male and 30 (48.36%) female patients. This difference was statistically significant. Figure II. p-value was calculated as 0.05.

Table I reports the association of H-pylori induced infection with lymphoid follicle formation in gastric biopsies using the Chi-square test. Among 81 (66.39%) H.pylori positive gastric biopsies reveal 49 (40.16%) lymphoid follicle formation. There was a significant association observed between H.pylori induced infection and lymphoid follicle formation with p<0.01.

Table II shows mild (12) H.pylori infection had mild (8) number of lymphoid follicle formation in contrast to severe (43) gastritis reveal increase (24) number of lymphoid follicles formation. Thus, more follicle formation induced by severity of H. pylori-infected gastritis.

FIGURE I: H. PYLORI-INFECTED PATIENTS ACCORDING TO AGE DISTRIBUTION

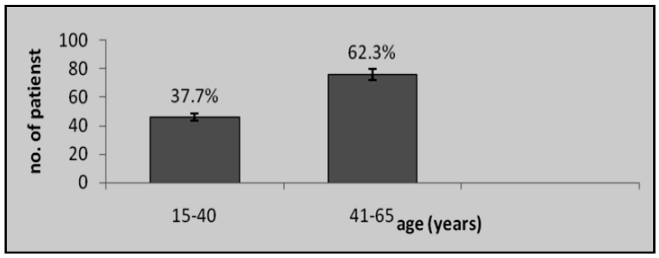
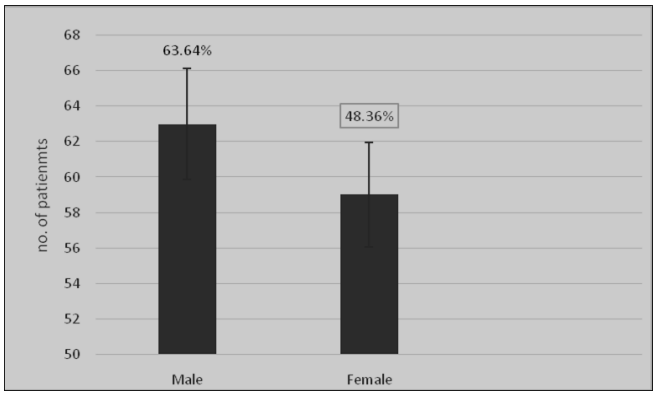


FIGURE II: H.PYLORI INDUCED INFECTION WITH GENDER DISTRIBUTION IN GASTRITIS PATIENTS



P value < 0.05 (*) is significant.

TABLE I: ASSOCIATION OF H. PYLORI INFECTION AND LYMPHOID FOLLICLE FORMATION IN GASTRIC BIOPSIES

	No of Patients	Percentage %	p- value
H.pylori infection	81	66.39	0.03
Lymphoid follicle formation	49	40.16	

**p<0.05 was considered significant using the Chi-Square test.*

TABLE II: H-PYLORI INFECTION AND LYMPHOID FOLLICLE FORMATION IN GASTRIC BIOPSIES WITH REGARDS TO SEVERITY

Groups	Severity	H. pylori infected patients	Patients with lymphoid follicle formation
1	Mild	12	8
2	Moderate	26	17
3	Severe	43	24

P-value for the association of H.pylori with the severity of gastritis=0.000
P-value for association of lymphoid follicle formation with severity of gastritis=0.002

DISCUSSION

In the case of chronic gastritis, Helicobacter pylori are

one of the important causative agents and have been reported as an important source of lymphoid tissue-oriented inflammation and development of B cell lymphoma. H. pylori are responsible to accelerate the mutated proliferation in gastric mucosa contains to enhance the number of lymphocytes in the lamina propria. This condition leads to the formation of lymphoid follicles and aggregates in patients of gastritis[1,8]. A number of studies are being conducted across the world to establish the association of H.pylori induced gastritis and MALT lymphoma[9-13]. A recent study in Iran also showed strong correlation[14].

The current study was planned to determine the frequency of H-pylori induced infection and lymphoid follicle formation (precursor of MALT Lymphoma) to the severity of gastritis using updated Sydney scoring system as (mild, moderate and severe)[15]. This may be helpful in early detection of positive cases for appropriate antibiotic therapy. H-pylori eradication therapy can save the patient from developing MALT Lymphoma and other malignancies[3].

The prevalence H. pylori infection was 66% in our study, while in previously published papers show a wide range from 15.1% to 87.7% depending on socioeconomic status, hygiene and sanitary condition[14]. In addition to this, it was also observed that most of the infected patients (62.30%) were belonged to the middle age group (41-65) years with a mean age calculated was 44.39±12.29 years. These results are supported and very close to the previous studies conducted in the local population of Pakistan with the mean age of 41.95 years[16]. Similarly, stratification for the frequency of H-pylori induced infection in gastric biopsies with regards to gender showed the difference. However, most of the studies in the same context showed no correlation of age and gender with the severity of gastritis, follicle formation and frequencies of H. pylori[17]. The stratification for frequency of H-pylori infection in gastric biopsies with regards to severity showed a significant difference between three groups (G1: mild, G2, moderate & G3 severe) in the presented study which reflected the strong association between the frequency of H-pylori infection and the severity of gastritis. Liu W, et al.[12] strongly favor the association of 96% patients with H-pylori with chronic gastritis while studying 160 patients. Another study conducted by Mehmood K 2014[18] also supported the association of the presence of H. pylori with gastritis severity. Similarly, all of the three groups showed a significant association with the formation of lymphoid follicle. Previous studies also supported the same idea[6]. In a comprehensive study, Genta R 1994[19] concluded that finding even a single lymphoid follicle in a gastric biopsy specimen is associated with a very high probability (>90%) of detecting H. pylori in the same or in another synchronous biopsy specimen obtained from that patient. Lymphoid follicles are absent in the normal stomach[20], therefore their appearance in the stomach with H. pylori-associated gastritis, is an issue of considerable interest. The development of mucosa-associated lymphoid tissue is a necessary first step in the development of primary MALT lymphoma in various organs such as lung, thyroid or stomach that are normally devoid of MALT[21,22]. Therefore, association in the stomach mucosa suggests a causal relationship between H. pylori and the origin of gastric MALT lymphoma. Our study also revealed a significant association between H. pylori infection and lymphoid follicle formation.

CONCLUSION

We concluded that the frequency of H-pylori infection and lymphoid follicle formation (precursor of MALT lymphoma) in gastric biopsies is significantly associated and early detection of positive cases for appropriate antibiotic therapy and H-pylori eradication therapy can save the patient from developing MALT Lymphoma and other malignancies.

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AUTHOR CONTRIBUTIONS

Parween S: Main author, idea, collection of data and analysis
Mehboob S: Manuscript writing
Sultan BA: Review & proof reading
Irshad Z: Review & proof reading
Shaikh A: Data analysis
Kumar S: Proof reading

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