

## Original Article

### Histological Changes in Gastric Biopsies from *Helicobacter Pylori*-Infected Patients With and Without Peptic Ulcer

Alireza Abdollahi<sup>1</sup>, Farid Azmoudeh Ardalan<sup>1</sup>, Hossein Foroutan<sup>2</sup>, Firouzeh Moradkarami<sup>3</sup>

1. Dept. of Pathology, Tehran University of Medical Sciences, Tehran, Iran.

2. Dept. of Gastroenterology, Tehran University of Medical Sciences, Tehran, Iran.

3. Tehran University of Medical Sciences, Tehran, Iran.

#### ABSTRACT

**Background and Objective:** Long period risk of gastric carcinoma in people affected with chronic *Helicobacter pylori* gastritis is 5 times more than normal people. Perhaps histological changes due to *helicobacter pylori* infection could be used for screening people at risk of gastric carcinoma and peptic ulcer.

**Materials and Methods:** This study has been carried out as a cross-sectional process and we compared histological changes observed in *Helicobacter pylori* chronic gastritis in 30 patients with peptic ulcer and 30 patients without the ulcer and then classified them according to Sydney scoring system, and after collecting data, we analyzed them by SPSS software.

**Results:** Sixty percent of patients with ulcer were male and forty percent were female. In addition, 56.7% of patients without ulcer were male and 43.3% were female without a statistically significant difference ( $p = 0.793$ ). Mean age in ulcer group was 56.4 years and in non-ulcer group was 48.9 years that there was no significant statistical difference ( $p = 0.057$ ). Chronic gastritis frequency increases within people in their sixth decade and after that. There was no significant difference for degree of infection with *Helicobacter pylori* ( $p = 0.346$ ), metaplasia ( $p = 0.885$ ), chronicity ( $p = 0.796$ ) and degree of activity ( $p = 0.249$ ), atrophy ( $p = 0.781$ ) in patients with or without ulcer.

**Conclusion:** There was no significant difference in any of the variables of the study including degree of infection with *Helicobacter pylori*, chronicity, disease activity and intestinal metaplasia between both groups with and without peptic ulcer.

**Key words:** *Helicobacter pylori*, Peptic ulcer, Gastric cancer

#### Introduction

According to histological analysis of gastric biopsy in non-tumor cases, a wide range of histological changes has been observed which are usually classified as gastritis. The most common histological findings in gastric biopsies are chronic

gastritis, so that in Western societies, the prevalence of histological changes of chronic gastritis reaches to 50% in elder patients. Chronic gastritis is the chronic inflammation of gastric mucosa which in most cases is without clinical symptoms and shows normal endoscopy but after all, in many cases, it could result

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Address communications to: Dr. Alireza Abdollahi, Department of Pathology, Tehran University of Medical Sciences, Tehran, Iran.

Email: dr\_P\_abdollahi@yahoo.com

in peptic ulcer, atrophy, intestinal metaplasia and gastric carcinoma. Histological changes of chronic gastritis include lymphocytes, basophils, plasma cells infiltration and other inflammatory cells in lamina propria and neutrophils infiltration in active cases of disease. Other findings include *Helicobacter pylori* existence on superficial epithelium of mucosa, atrophy of mucosal glands, dysplasia, intestinal metaplasia, lymphoid assembly with germinal centers and disappearance of parietal cells in autoimmune gastritis. Predominantly, these changes occur in the absence of ulcer but in some cases, they could be seen with peptic ulcer (1-3). Chronic infection by *H. pylori* is the most important cause for chronic gastritis and peptic ulcer. Infection by this microorganism is the most common infection in the world and nearly in all cases of chronic gastritis; 70-90% of duodenal ulcers and 70% of gastric ulcers have been observed. Bacterial colonization rate increases with age. This rate in developing countries reaches up to 70% for people below 10 years of age, to more than 90% for people below 20 years of age and in American adults reaches to 50% in people under 50 years (4). Peptic ulcer incidence in people with *H. pylori* infection is 1% per year which is 6-10 times more than common population. Incidence probability of peptic ulcer in any period in life of people with infection with *H. pylori* is 15-20%. It is not known why ulcer is observed just in some of patients infected with *H. pylori* and its consequent gastritis. It seems that in some types of bacteria such as varieties with cytotoxin-associated gene A (cag A) which results in more severe inflammation and more cytokine production, ulcer incidence probability increases. But it can not be predicted just based on this factor. Peptic ulcer is one of the most common clinical problems and if it is not treated, it may cause implications like perforation, bleeding and stricture. Although chronic gastritis is mostly without symptoms, in case it is not diagnosed the chronicity of disease, may result in gastric carcinoma (5-7).

This study which was carried out on histological data and based on Sydney scoring system, in fact is a comparative study between observed changes in gastric biopsy of patients with *H. pylori* infection with or without ulcer.

### **Materials and Methods**

This study was carried out as a cross-sectional process. Our study populations includes all patients

who have been examined because of their gastric biopsy pathology and who suffered from *Helicobacter pylori* infection and their gastric biopsy specimens were sent to a center in Iran during 2 years which is one of the most important centers in Iran. Data such as age, gender and presence and location of ulcer were collected from archives on the basis of pathological reports and endoscopies. All cases of gastric biopsy during these 2 years included 304 cases, 208 cases of which were *H. pylori* negative and omitted from the study. Other 96 cases were *H. pylori* positive and only 63 cases of them had endoscopies report in their records. Also, 3 cases were adenocarcinoma and were omitted from the study. Slides of other 60 cases have been reviewed by a pathologist through blind method and study variables were classified based on Sydney scoring system (8,9). All data such as age, gender, *Helicobacter pylori* infection degree, metaplasia, and etc. were entered into SPSS software and analyzed by frequency tables, chi-square and independent tests.

### **Results**

Finally by considering entry and omission criteria, 60 samples were obtained; 30 patients suffered from ulcer and 30 cases did not. Out of all 60 cases, 35 cases were male (58.3%) and 25 cases were female (41.7%). Meanwhile, 60% of patients with ulcer were male and 40% were female. In patients without ulcer, 56.7% were male and 43.3% were female and after statistical analyses by chi-square test, no significant difference between two groups was observed ( $p = 0.793$ ). Mean age in ulcer group was 56.4 with an age range 9-85 years, and in the non-ulcer group it was 48.9 with an age range of 14-78 years. After statistical analysis by independent samples test (t-test), no significant difference was observed between two groups ( $p = 0.057$ ). Regarding age distribution, it was observed that chronic gastritis frequency increases from the sixth decade of life. The degree of colonization with *H. pylori*, chronicity, activity and intestinal metaplasia were compared between two groups. After statistical analysis by chi-square test, no significant difference was observed between degree of colonization with *H. pylori* ( $p = 0.346$ ), degree of metaplasia ( $p = 0.885$ ), chronicity of disease ( $p = 0.796$ ) and degree of disease activity ( $p = 0.249$ ), in the two groups with or without ulcer (Tables 1-3)

In all cases, there was infiltration of, lymphocytes, plasma cells and neutrophils, except for one case in which there were no neutrophils and degree of

**Table 1. Degree of metaplasia in studied cases**

Degree of metaplasia	With Ulcer	Without Ulcer	Total
0	23	25	48
1	4	4	8
2	2	1	3
3	1	0	1
Total	30	30	60

**Table 2. Degree of disease activity in studied cases**

Degree of activity	With Ulcer	Without Ulcer	Total
0	0	1	1
1	7	8	15
2	12	16	28
3	11	5	16
Total	30	30	60

**Table 3. Degree of atrophy in studied cases**

Degree of atrophy	With Ulcer	Without Ulcer	Total
0	15	19	34
1	10	8	18
2	5	3	8
3	0	0	0
Total	30	30	60

disease activity was considered as zero. Eosinophils were observed in 21 cases (35%) and 40% of cases with ulcer (12 cases) and 30% of cases without ulcer had eosinophils (statistically not significant  $p=0.589$ ). Most cases of ulcer were found in small curvature of stomach and the least common site was the greater curvature. Moreover, the degree of atrophy was compared in patients with and without ulcer ( $p=0.781$ ). There were lymphoid follicles in 60% of all cases (36 cases) and in 53.3% of cases without ulcer (16 cases) and 66.6% of cases with ulcer (20 cases) (statistically not significant,  $p=0.292$ ). There was also foveolar hyperplasia just in 13.3% of all cases (8 cases), 20% of cases with ulcer (6 cases) and 6.6% of cases without ulcer (2 cases) and there was no significant difference between the two groups ( $p=0.129$ ).

## Discussion

In this study, we classified mentioned variables on the basis of Sydney classification system into 3 degrees of mild, moderate and severe and compared them between two groups of patients with or without ulcer. Saita et al in Japan who worked on 20 patients with *H. pylori* chronic gastritis with duodenal ulcer and 20 patients with *H. pylori* chronic gastritis without ulcer found that degree of colonization of this organism in antrum, gastric extract and duodenum of patients with duodenal ulcer was considerably more than of the group without ulcer (10,11). Also, in a research carried out by Kim et al in Korea, on histological features of gastric mucosa in patients with duodenal ulcer, chronic gastritis, gastric ulcer and gastric cancer

in 122 patients, it was observed that the degree of activity and chronic inflammation in patients with *H. pylori* infection is considerably higher than patients without such infection. Besides, in these patients *H. pylori* colonization, degree of activity, inflammation and atrophy in cases with duodenal ulcer in antrum is higher than of body, while in other cases degree of these variables in antrum and body is the same (12,13). Contrary to these studies, our results showed no significant difference between degrees of infection with *H. pylori*, degree of metaplasia, and chronicity in two groups of patients with or without ulcer. In another study which has been carried out by Neimol et al in Finland, 21 patients with gastric ulcer and their re-biopsy after 10 years were compared with control group without ulcer and it was observed that degree of gastritis and intestinal metaplasia in antrum in patients with ulcer is considerably higher than the control group. Abnormal eosinophilic infiltration has been shown to be persistent in patients with ulcer, while decreased in control group over time. This study suggests that course of *H. pylori* gastritis with ulcer is different from *H. pylori* gastritis without ulcer (14,15). In our study, eosinophils were observed in 21 cases (35%). Forty percent of cases with ulcer (12 cases) and 30% of cases without ulcer had eosinophils ( $p=0.589$ , statistically not significant). In this study, ulcer incidence had the highest degree in patients in their fifth decade of life, with a mean age of 56.4, while *H. pylori* chronic gastritis without ulcer is more common in patients who are in their fourth decade with a mean age of 48.9 years. Sixty percent patients with ulcer and 56.7% of patients without ulcer were male which indicates more incidences of chronic gastritis and peptic ulcer in men. Lymphoid follicles incidence in the study was 60% and foveolar hyperplasia incidence was 13.3%. Incidence of these variables in group with ulcer is slightly higher but it is not statistically significant. In the only study carried out by Zaitoun, no significant difference between lymphoid follicles incidence in patients with and without ulcer has been observed, but incidence in *H. pylori*-positive patients was 96% (16,17). The incidence of ulcer in lesser curvature was higher which was comparable with other studies and was predictable, however duodenal ulcers were less common than gastric ulcers (with an approximate ratio of 1 to 4) which is probably the result of not taking biopsies of gastric mucosa of patients with duodenal ulcers routinely.

## Conclusion

There was no significant difference in none of the studied variables including degree of colonization with *H. pylori*, chronicity, activity and degree of metaplasia in histological comparison of gastric biopsy in patients with such infection between both groups with and without peptic ulcer.

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