

# Histopathological Features of Helicobacter Pylori Positive and Helicobacter Pylori Negative Gastritis in Endoscopic Biopsies: First Comparative Study from Sahiwal, Pakistan

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## ABSTRACT

**Background and Objectives:** The intention of this study was to compare the histopathological features of helicobacter pylori positive gastritis (HPPG) and helicobacter pylori negative gastritis (HPNG) reported at Department of Pathology, Sahiwal Medical College & Allied Hospitals, Sahiwal, Pakistan.

**Methodology:** It was a descriptive cross-sectional study carried out at Histopathology Section, Department of Pathology, Sahiwal Medical College, Sahiwal. It included all the gastritis cases proven on histopathology on endoscopic biopsies sent from Gastroenterology Department GHAQTH Sahiwal from January 2020 to December 2020. HPPG and HPNG cases were sorted and the data was analyzed with help of SPSS version 20. Chi-square test was used to find p-value and the value of  $p < 0.05$  was taken as significant.

**Results:** In all 95 cases of gastritis were identified out of which 75.8% were HPPG and 24.2% were HPNG. More than 90% of HPPG had moderate and severe chronic inflammation in the biopsies as compared to only 17% in cases of HPNG and the difference was significant statistically ( $p < 0.00001$ ). About 98% cases of HPPG showed activity as compared to 8.7% cases of HPNG and this difference was statistically significant ( $p < 0.00001$ ). Lymphoid follicles were seen in biopsies of 34.7% cases of HPPG while this feature was absent in all HPNG cases and this difference was statistically significant ( $p = 0.00994$ ). No statistically significant variance was found in relation to age group, gender, location of biopsy and intestinal metaplasia in our study.

**Conclusion:** HPPG more frequently shows moderate/severe chronic inflammation, activity and lymphoid follicles in endoscopic biopsies as compared to HPNG. Our data, first of its kind from Sahiwal, is in accordance with the available literature.

**Keywords:** Helicobacter pylori, gastritis, endoscopic biopsy, histopathology.

## INTRODUCTION

Gastritis stands for “inflammation of gastric mucosa”<sup>1</sup> and it can be either acute or chronic. Acute gastritis is sudden in onset, lasts for 2-10 days and can be erosive or non-erosive in nature. Chronic gastritis develops gradually with symptoms lasting a long time (weeks to years); if not treated<sup>2</sup>.

More than 50 % of the world’s total population is affected by these diseases to various extent<sup>3,5</sup>. Patient may be asymptomatic, intermittent symptomatic or persistent symptomatic including anorexia, nausea, vomiting, dyspepsia, abdominal pain, bloating and diarrhea. Depending on etiology it may be of two types HPPG and HPNG.

About 50 years ago when H. Pylori was discovered, gastritis received more attention and now believed that it is the major etiological agent of the gastritis. Still gastritis is one the most under rated disease, clinically<sup>4</sup>.

Helicobacter Pylori is a gram negative, curved/seagull shaped rod that was discovered by Warren and Marshall in 1982<sup>4</sup>. This organism transmits through orofecal route<sup>1</sup>. Cooking and eating habits, personal and environmental hygiene and socioeconomic status has a critical role in transmission and progression of the disease<sup>4</sup>. It usually affects antrum and then gradually spread to entire stomach. H. Pylori normally reside in gastric mucosa or attached to surface epithelium<sup>3</sup>. It can be seen on H&E stain, Warthin Stary Silver stain, Genta stain, Giemsa staining or IHC<sup>5,6</sup>. Initially it causes inflammation & then develops intestinal metaplasia<sup>1,6</sup>. Spectrum of pathological disorders inflicted by H. Pylori includes acute & chronic gastritis, PUD, carcinoma of stomach and MALT Lymphoma<sup>1,3</sup>. In 1994 WHO named this bacterium ‘definite biological carcinogen’<sup>5</sup>. The diagnostic tests for H. Pylori include non-invasive (urea breath test, serology and stool antigen) & invasive tests (culture, histology and rapid urease test)<sup>3</sup>.

The HPNG is where typical features of H. Pylori gastritis is present but no organism in gastric mucosa/epithelium can be seen;

including mostly of missed bacterial infections due to use of PPI or antibiotic. Etiological factors of HPNG includes NSAIDS, stress, autoimmune disease, alcohol consumptions, infections & trauma. HPNG can be detected by more sensitive methods like nested & quantitative PCR on gastric biopsies<sup>3,6</sup>.

Still HPNG has not achieved the status of independent disease<sup>6</sup>. Various studies have been conducted previously to differentiate b/w that that distinctive features of HPPG & HPNG suggesting that HPPG commonly affects females, peaked prevalence is in 4<sup>th</sup> or 5<sup>th</sup> decades of their lives and intestinal metaplasia is commonly associated with HPPG while HPNG shows low and relatively flat pattern<sup>3</sup>.

The suggestive features of our study are HPPG shows more frequently moderate and severe chronic inflammation, activity, lymphoid follicles as compared to HPNG.

## MATERIAL AND METHODS

It was a descriptive cross-sectional study conducted at Histopathology Section, Department of Pathology, Sahiwal Medical College, Sahiwal. It included all the gastritis cases proven on histopathology on endoscopic biopsies sent from Gastroenterology Department GHAQTH Sahiwal from January 2020 to December 2020. HPPG and HPNG cases were sorted and the data was analyzed with help of SPSS version 20. Chi-square test was employed to determine p-value and the value of  $p < 0.05$  was taken as significant.

## RESULTS

A total number of ninety five (95) patients were enrolled in this study, segregated into two different groups. One group featured H. pylori (HP) positive gastritis patients, while the other had H. pylori negative gastritis patients. Out of 95, 72 patients fell in the HP positive gastritis group and the remaining 23 constituted the HP negative gastritis division. Table 1 and 2 contain the demographic details of the patients. The study highlights two predominant age

sets in both groups, i.e. 31-40 years (HP positive gastritis 25% and HP negative gastritis 26.1%) and 41-50 years (HP positive gastritis 29.1% and HP negative gastritis 26.1%), the details of which are given in the Table 1. The gender distribution in HP positive group was noted as 59.7% males & 40.3% females, while the same variable distribution in HP negative group was 52.1 % males and 47.9% females. Biopsies were taken from three sites of stomach antrum, body and fundus. In both study groups, antrum was the common site of biopsy, accounting for 86.1% in HP positive and 82.6% in HP negative individuals, which was followed by the fundus (HP+ 12.5% and HP- 13%) and body (HP+ 1.4% and HP- 4.4%), details shown in the Table 3. The feature of chronic inflammation was also observed in this study, categorized as mild, moderate and severe forms of inflammation. Moderate type of chronic inflammation was found in the study in highest percentage, i.e. 73.6%, followed by the severe and mild form at 18.1% and 8.3% respectively. In the other group, however, comprised of HP negative gastritis patients, chronic inflammation was recorded only in two forms, i.e. mild and moderate with values of 82.6% and

Table.1: Age distribution according to various age groups

Age Range (years)	HP + (n=72)	%	HP- (n=23)	%
20 or less	1	1.9	1	4.3
21-30	14	19.2	2	8.6
31-40	18	25	6	26.1
41-50	19	26.9	6	26.1
51-60	10	13.5	5	21.7
Above 60	10	13.5	3	13.2

The chi-square statistic is 18.00. The p-value is .324. The result is not significant at p < .05.

Table.2: Gender distribution

Gender	HP + (n=72)	%	HP - (n=23)	%
Male	43	59.7	12	52.1
Female	29	40.3	11	47.9

The chi-square statistic is 2.00. The p-value is 0.157. The result is not significant at p < .05.

Table .3: Location of stomach biopsies

Location of Biopsy	HP + (n=72)	%	LN- (n=23)	%
Antrum	62	86.1	19	82.6
Body	1	1.4	1	4.4
Fundus	9	12.5	3	13.0

The chi-square statistic is 0.6859. The p-value is 0.7541. The result is not significant at p < .05.

Table.4: Severity of Chronic inflammation

Chronic Inflammation	HP +	%	LN- (n=23)	%
Mild	6	8.3	19	82.6
Moderate	53	73.6	4	17.4
Severe	13	18.1	0	0.0

The chi-square statistic is 49.8788. The p-value is less than 0.00001. The result is significant at p < .05.

Table .5: Presence of Neutrophilic activity

Activity	HP + (n=72)	%	HP - (n=23)	%
Present	71	98.6	2	8.7
Absent	1	13.9	21	91.3

The chi-square statistic is 71.1967. The p-value is less than 0.00001. The result is significant at p < .05.

Table.6: Presence of Atrophy

Atrophy	HP + (n=72)	%	HP - (n=23)	%
Present	0	0	0	0
Absent	72	100	23	100

The chi-square statistic is not applicable/could not be performed.

Table.7: Presence of Metaplasia

Metaplasia	HP + (n=72)	%	HP - (n=23)	%
Present	1	1.4	0	0
Absent	71	98.6	23	100

The chi-square statistic is 0.3228. The p-value is 0.569904. The result is not significant at p < .05.

Table .8: Presence of Lymphoid follicles

Lymphoid follicles	HP + (n=72)	%	HP - (n=23)	%
Present	25	34.7	0	0
Absent	47	65.3	23	100

The chi-square statistic is 10.8383. The p-value is less than 0.000994. The result is significant at p < 0.05.

17.4% respectively (Table:4). 98.6% of HP positive patients were also found to have neutrophilic activity (Table:5). Both groups did not show any significant findings of atrophy. The metaplasia feature was also hardly observed in the HP positive group, i.e. evident in only 1 patient out of 72 (1.4%) (Table.6 & 7). No lymphoid follicle was observed in HP negative gastritis patients, while 34.7% of HP positive patients had it.

H. Pylori positive vs. H.pylori negative gastritis

DISCUSSION

Our study highlighted the comparison of the key features of infectious and non infectious gastritis. We found 72 patients (75.7%) who suffered from H. pylori positive gastritis and 23(24.21%) patients had H. pylori negative gastritis. The gender distribution of these findings revealed the male dominance in both types of gastritis, i.e. more than 50% , also described in the earlier study<sup>6</sup>. We found that the middle-aged group was mostly involved in both type of gastritis. Middle aged patients in their 3<sup>rd</sup> and 4<sup>th</sup> decade of life showed the highest occurrence of gastritis, as previously described by the Shaohua Chen et al.<sup>7</sup>. Biopsies of the stomach were taken from different sites in our study. We took more than 80 percent biopsies from antrum in both types of gastritis, the most reliable and one of the most recommended sites for gastric biopsies. Antrum is one of the four sites for gastric biopsies as described by Satoh K in his study<sup>8</sup>. Literature suggests that mostly antrum of stomach is the site for intestinal metaplastic changes and atrophic gastritis with colonization of the organism (H.pylori)<sup>9,10</sup>.

We found increased neutrophilic activity in the infectious gastritis, observed in 71 (98.6%) patients, while majority of the patients with (91.3%) with non infectious gastritis lacked it. Sonam Pruthi's study also suggested a higher prevalence of neutrophilic activity in association with H. pylori positive gastritis. She found 85.7% cases with moderate neutrophilic activity. She also observed increased lymphoid follicles in infectious gastritis (55.2%) patients, but we found only 34.7% in H.pylori positive gastritis group, with none in H.pylori negative gastritis group<sup>11</sup>.

We categorized the inflammation in mild, moderate and severe forms. Moderate infiltration of lymphocytes and mononuclear cell was seen in majority of the cases in HP positive gastritis with 73.6%, followed by severe (18.1%) and mild (8.3%) infiltration. However, in the scenario of HP negative gastritis cases, mild chronic inflammation was predominant with 82.6%. Many studies indicate increased lymphocytic infiltration with H.pylori associated gastritis<sup>12-14</sup>, but some of the literature also contradicted the above mentioned findings<sup>15</sup>.

Gastric mucosal atrophy is a marked feature of infectious gastritis and previously reported in many researches, while in our study, the feature of atrophy was not seen in H. pylori associated gastritis. However, atrophy was observed in all patients presented with noninfectious gastritis. Similarly, previous literature strongly indicates the association of metaplasia with infectious gastritis, which contradicted the findings of our research. Only one patient (1.4%) had metaplastic change in HP positive gastritis group<sup>11,12,13,16,17</sup>.

CONCLUSION

HPPG more frequently shows moderate/severe chronic inflammation, activity and lymphoid follicles in endoscopic biopsies

as compared to HPNG. Our data, first of its kind from Sahiwal, is in accordance with the available literature.

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**Author's Contributions:** RAL: analysis, study design, interpretation of data and final approval from all authors. QAT: histopathological analysis. SHS: drafting of manuscript. SS: Acquisition of data. MS: manuscript preparation. NN: critical analysis and review of the manuscript.

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