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Original research article

THE ROLE OF HISTOLOGICAL FINDINGS IN H. PYLORI-INDUCED GASTRITIS: CLINICAL IMPLICATIONS AND BEYOND

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Abstract: *This study aimed to determine the role of histological findings in H. Pylori-induced gastritis. This cohort study involved 80 patients of both genders. The patients were endoscopically and histopathologically examined and followed up within six months after treatment, from April 2023 to September 2023. Multiple biopsies were taken from different stomach regions and compared to the endoscopic findings. Eighty patients were enrolled with a mean age of 38.80±17.24 years. The study showed that most of the patients improved. There was a significant relationship between the histopathological grading of gastritis (Sydney system) and the degree of gastritis observed through an endoscope among H. Pylori intensity, chronic inflammation, neutrophil activation, glandular atrophy, and degree of gastritis. However, other parameters, such as intestinal metaplasia and surface epithelium damage of the Sydney system, revealed no significant relationship. Our study found a very strong positive correlation between the degree of gastritis (endoscope) and the degree of gastritis (histopathology) before treatment. There was also a significant relationship between the degree of induced gastritis in endoscopy and histopathology after treatment. The p-value was 0.003, and the two variables had a moderate positive correlation after treatment. It was concluded that biopsies performed during endoscopy are essential for diagnosing and treating gastritis and associated disorders. Healthcare providers can customize treatment regimens to target specific underlying causes and handle potential problems using the information gathered from biopsies.*

Keywords: H. pylori-Induced Gastritis, Histological Findings, Clinical Implications

Introduction

Gastritis refers to the inflammation of the stomach lining.(Kayaçetin and Güreşçi, 2014; Rugge et al., 2020) Various factors can cause this inflammation, and when it is specifically attributed to the presence of Helicobacter pylori (H. pylori) bacteria or certain irritants, it is often referred to as "induced gastritis."(Piscione et al., 2021)

Helicobacter pylori (H. pylori) is a bacterium that infects the human stomach and is a major cause of various gastrointestinal disorders, including gastritis.(Alexander et al., 2021) Histological findings play a crucial role in understanding the pathogenesis of H. pylori-induced gastritis, providing valuable information for clinical diagnosis, management, and prognosis.(Sugano et al., 2015; Zhuang et al., 2015) This bacterium has a predilection for the human stomach and significantly contributes to various gastric disorders, including gastritis.(Denic et al., 2020; Flahou et al., 2016) Indeed, H. pylori infection is widespread and is considered one of the most common chronic bacterial infections worldwide.(Amieva and El–Omar, 2008; Burucoa and Axon, 2017) Around two-thirds of the world's population is estimated to be infected with H. pylori.(Katelaris et al., 2023) H. pylori infection is more prevalent in developing countries and is often acquired during childhood. Around 50% of people on the planet have an H. pylori seropositive. (Park et al., 2018) There has been a significant decline in the prevalence of H. pylori infection in developed nations. (Hooi et al., 2017) Furthermore, first- and second-generation immigrants from the underdeveloped world to Western nations sometimes have much higher frequencies of H. pylori.

The role of histological findings in H. pylori-induced gastritis is crucial for several reasons (Peek Jr and Blasser, 1997) providing valuable insights into the nature and impact of the infection. Histology, the microscopic examination of tissues, allows for the detailed assessment of structural and cellular changes in the gastric mucosa. This study emphasizes the practical applications in clinical medicine while hinting at potential contributions to the broader scientific understanding of the condition. It leads to exploration beyond immediate clinical applications, possibly extending to research and academic implications. The study's objective was to determine the role of histological findings in h-pylori-induced gastritis.

Methodology

The cohort study was conducted at the Department of Medicine in Khyber Teaching Hospital, Peshawar, Pakistan. The study was from April 2023 to September 2023, which is a period of 6 months. Non-probability purposive sampling was used to recruit 80 patients diagnosed with H. pylori infection, with evidence of gastritis confirmed through histological examination of gastric biopsy specimens. The

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inclusion criteria included patients of both genders aged between 15 to 70 years. Patients with other significant gastrointestinal conditions and those receiving treatment for H. pylori infection were excluded.

The study was conducted after obtaining approval from the hospital's ethical committee. All the participants provided informed consent and were clinically examined and treated. Gastric biopsy samples were obtained through endoscopy, and multiple biopsies were taken from different stomach regions. The specimens were fixed in 10% buffered formalin, processed to allow for thin sectioning, and cut into sections using a microtome. Hematoxylin and eosin (H&E) staining was used to stain the paraffin wax, and Warthin-Starry or modified Giemsa stain was used to identify H. pylori bacteria.

All the sections were examined under a microscope, and the degree of inflammation, activity, atrophy, and intestinal metaplasia were scored using the Sydney System. SPSS Version 25 was used for statistical analysis. All the patients were followed throughout the study.

Results

A total of 80 patients, with a mean age of 38.80± 17.24 years, were enrolled. In this study, most patients were 15 to 30, and the least number were in the 46 to 60 years and >60 years age group (Table 1). Patients were divided based on the degree of gastritis, which was mild, moderate, and severe before and after treatment, as shown in Table 2. The present study showed that most of the patients improved.

A significant relationship exists between histopathological grading of gastritis (Sydney system) and degree of gastritis by endoscope among H. Pylori intensity, chronic inflammation, Neutrophil activation, Glandular atrophy, and degree of gastritis, but other parameters such as Intestinal metaplasia and Surface epithelium damage of the Sydney system revealed no significant relationship (Table 3).

In our study, in terms of correlation, it was found that there is a very strong positive correlation between the degree of gastritis (endoscope) and the degree of gastritis (histopathology) before treatment (Table 4). There is a significant relationship between the degree of induced gastritis in endoscopy and histopathology after treatment, as the P-value is 0.003, and there is a moderate positive correlation between both variables after treatment (Table 5).

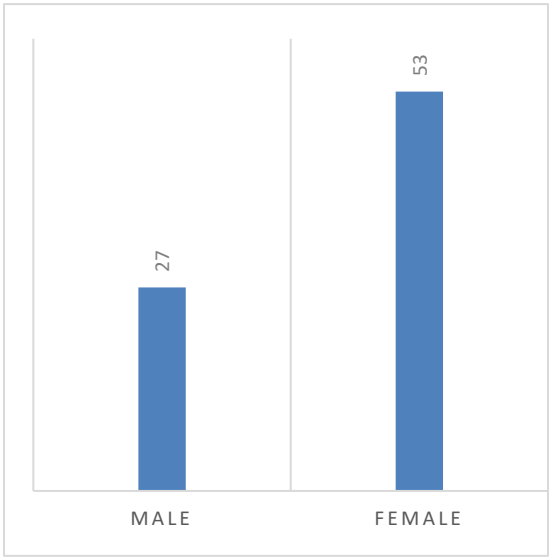

Fig 1: Bar graph showing gender distribution

Table 1: Distribution of patients according to age group *(n=80)*

Age Group (Years)	Frequency	Percentage
15 to 30	31	38.8
31 to 45	26	32.5
46 to 60	9	11.3
>60	14	17.5
Total	80	100

Table 2: Number and percentage of degree of gastritis before and after treatment (*n=80)*

Degree of gastritis	Before Treatment	After Treatment
Mild	11(13.8)	49 (61.3%)
Moderate	32(40.0)	36 (30.0%)
Severe	37(46.3)	2(2.5%)
TOTAL	80	80

P-value 0.04

Table 3: Histopathological grading (revised Sydney system by Aydin et al., 2003) according to severity of gastritis by endoscopy modified Lanza by Shim et al., 2019)

Histopathological grading before treatment	Degree of gastritis before treatment (endoscope)			P-value
	Mild (N=11)	Moderate (N=32)	Severe (N=37)	
Chronic inflammation				
Mild	5 (45.5%)	18 (56.3%)	9 (24.3%)	0.06
Moderate	5 (45.5%)	13(40.6%)	22(59.5%)	

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Severe	1(9.1%)	1(3.1%)	6 (16.2%)	
Neutrophil activation				
Mild	4(36.4%)	17(53.1%)	9(24.3%)	0.04
Moderate	6(54.5%)	14(43.8%)	19(51.4%)	
Severe	1(9.1%)	1(9.1%)	9 (24.3%)	
Surface epithelium damage				
Mild	1(9.1%)	11 (34.4%)	9 (24.3%)	0.34
Moderate	6 (54.5%)	16 (50.0%)	22(50.0%)	
Severe	4 (36.4%)	5 (15.6%)	6 (16.2%)	
Glandular atrophy				
Mild	10(90.9%)	24(75.0%)	15(40.5%)	0.003
Moderate	1(9.1%)	7(21.9%)	22(59.5%)	
Severe	0(0.0%)	1(3.1%)	0(0.0%)	
Intestinal metaplasia				
Mild	10(90.9%)	25(78.1%)	17(45.9%)	0.06
Moderate	1(9.1%)	6(18.8%)	20(54.1%)	
Severe	0(0.0%)	1(3.1%)	0(0.0%)	
H. pylori intensity				
Mild	4 (36.4%)	15 (48.4%)		0.01
Moderate	5 (45.5%)	11(35.5%)		
Severe	2 (18.2%)	5 (16.1%)		

Table 4: Comparison & correlation between degree of H. pylori-Induced gastritis in endoscopy and histopathology before treatment. (*n=80)*

Degree of gastritis (endoscope) Before treatment	**Degree of gastritis (histopathology) before treatment**		
	Mild (N=11)	Moderate (N=32)	Severe (N=37)
Mild	2 (25.0%)	5(14.7%)	4 (10.5%)
Moderate	1 (12.5%)	17(50.0%)	10(36.8%)
Severe	5 (62.5%)	12(35.3%)	20(52.6%)
P-V	0.027		
Kendall's tau-c	0.92		

Table 5: Comparison & correlation between degree of Induced gastritis in endoscopy and histopathology after treatment. (*n=80)*

Degree of gastritis (endoscope) after treatment	**Degree of gastritis (histopathology) after treatment**		
	Mild (N=11)	Moderate (N=32)	Severe (N=37)
Mild	46 (68.7%)	1(9.1%)	2 (100.0%)
Moderate	20 (29.9%)	9(81.8%)	0(0.0%)
Severe	1 (1.5%)	1(9.1%)	0(0.0%)
P-Value	0.003		
Kendall's tau-c	0.327		

Discussion

The present study aimed to determine the role of Histological Findings in H. pylori-induced gastritis. Histological evaluation is essential to diagnosing H. pylori-induced gastritis and helps guide treatment decisions. Under microscopic examination, H. pylori bacteria may be observed in the gastric mucosa. They typically colonize the surface of the epithelial cells or within the gastric glands. Some cases of H. pylori-induced gastritis may show the formation of lymphoid follicles in the gastric mucosa. In the present study, the mean age of the enrolled patients was 37.59±6.37 years. H. pylori infection is often acquired in childhood, and prevalence in many populations tends to decrease with age.(Zabala Torrres et al., 2017) This means that younger individuals are more likely to be infected, while older individuals may have a lower prevalence, as our study shows that mostly 15- to 30-year-old individuals were affected with H-pylori-induced gastritis. A study by Hayfa A. Hussein 2019) stated that patients' ages ranged from 18 to 70 years old, with a mean age of 42.9. The most significant cases, 34.3%, were found in the age range of 31 to 40. Instances followed this in the age group of 41-50 years old, 22.5%. However, in our study, most patients were in the 15 to 30 age group, followed by the 31 to 45 age group. The least number of patients were of the 46 to 60 years and >60 years age group.

A notable and substantial correlation exists between the severity of chronic gastritis observed in histopathology

before and after the treatment. Like our study, the same results were found in the study conducted by Tawfeek Ibrahim Mohamed Ibrahim et al.(Tawfeek Ibrahim et al., 2023). There is a strong correlation between the degree of gastritis as determined by endoscopy in individuals with a positive H. pylori test in their stool before treatment and a negative result after it. Clinical practice is significantly impacted by an accurate and trustworthy histological diagnosis of H pylori gastritis as a therapeutic indicator. Because intestine metaplasia and atrophy in histological specimens were linked to a higher risk of gastric cancer, reliability in identifying these alterations was particularly crucial.(Aydin et al., 2003; Meining and Stolte, 2002) From our study findings, it was clear that there was an increase in the improvement of cases. The female ratio was high in our study as compared to males. Several studies supported our study. (Hussein, 2019; Tawfeek Ibrahim et al., 2023) In our study, we also checked the Histopathological grading such as chronic inflammation, Surface epithelium damage, Glandular atrophy, Intestinal metaplasia, and H. pylori intensity before treatment, and it was found that treatment of H. pylori may improve gastric mucosal inflammation, atrophy, and prevent the progression of intestinal metaplasia. Lu et al. also stated the same results (Aydin et al., 2003). Studies have shown that when H. pylori is successfully eradicated, it can reduce gastric mucosal inflammation, prevent atrophy, and halt or reverse the progression of intestinal metaplasia.

Conclusion

Helicobacter pylori (H. pylori) infection is a common bacterial infection affecting individuals of various ages. Routine biopsies during endoscopy are crucial in diagnosing and managing gastritis and related conditions. The information obtained from biopsies helps healthcare professionals tailor treatment plans to address the specific underlying causes and manage any complications that may arise.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate.
Approved by the department Concerned.
Consent for publication
Approved
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Not applicable

Conflict of interest
The authors declared an absence of conflict of interest.

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