Changing Trends of Peptic Ulcer Disease & Helicobacter pylori Infection: A Retrospective Analysis.

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ABSTRACT:

Objective: To analyze the current trends in Peptic ulcer disease (PUD) with respect to ulcer type, *H. pylori* status, and associated risk factors in a tertiary care setting.

Methodology: This retrospective descriptive study was conducted at Shalamar Hospital, Lahore, from November 2023 to November 2025. This study included 285 patients who underwent upper gastrointestinal endoscopy during the study period. Demographic data, clinical features, endoscopic findings, *H. pylori* status (determined by rapid urease test and histopathology), and risk factors such as NSAID use, smoking, and alcohol intake were extracted from hospital records.

Results: The mean age of patients was 46.8 ± 13.2 years, with a male-to-female ratio of 1.3:1. Duodenal ulcers were more frequent (58.9%) than gastric ulcers (36.1%), while combined lesions accounted for 4.9%. *H. pylori* infection was detected in 60% of patients overall, with a significantly higher prevalence among duodenal ulcers (68.5%) compared to gastric ulcers (48.5%) ($p = 0.002$). NSAID use was reported in 32.3% of patients, showing a strong association with gastric ulcer development ($p = 0.01$).

Conclusion: *H. pylori* remain a major risk factor for duodenal ulcer disease, gastric ulcers are increasingly associated with NSAID exposure, particularly among elderly patients.

Keywords: *Helicobacter pylori*, prevalence, NSAID, Gastric ulcer, Duodenal ulcer.

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Introduction:

Peptic ulcer disease (PUD) has historically been considered one of the most common and clinically significant disorders of the gastrointestinal tract.[1] Throughout the 20th century, its etiology was attributed to psychosomatic stress, lifestyle and dietary indiscretions. The acid suppression and lifestyle change paradigm were then used to treat the condition as opposed to treating a root cause.[2] This revolutionary development came in 1983, when Barry Marshall and Robin Warren discovered a gram-negative helical bacterium, Helicobacter pylori (*H. pylori*), as a significant cause of PUD, which inhabited the gastric mucosa. This finding changed the epidemiology and treatment of the disease as well as making the researchers who carried out the study win the Nobel Prize in 2005.[3] The epidemiological trends of PUD have changed significantly since that time throughout the world.[4] An extensive decrease in the incidence of *H. pylori* infection has been observed in high-income countries, especially the provided sanitation, improved socioeconomic status, and the widespread access to antibiotics. As a result, the occurrence of the *H. pylori*-related duodenal ulcers has drastically reduced. Nevertheless, such a decrease has not deprived peptic ulcer disease but it has changed the arena to new etiological factors.[5] The most common of them are the use of non-steroid anti-inflammatory drugs (NSAIDs), aspirin, and antiplatelet treatment, especially in the aging group with cardiovascular comorbidities.[6] Household crowding, poor sanitation, contaminated water supply, and access to health care, are among the factors that lead to endemic transmission. Consequently, *H. pylori* PUD and its complications, such as gastric outlet obstruction, bleeding, and perforation, persist in these regions.[7] The significance of socioeconomic factors in disease distribution and the requirement for region-specific measures are reflected in this international inequality. The other important trend that has influenced the epidemiology of PUD is the increased challenge of antibiotic resistance in H. pylori treatment.[8] Conventional triple therapy, which was previously very effective, is reported to be less efficacious mainly due to resistance to clarithromycin, metronidazole, and levofloxacin. Asia is one of the regions where the issue is especially acute, and the rates of resistance are the highest in the world.[9] Consequently, other regimens with bismuth quadruple therapy and customized therapy on the basis of susceptibility testing are gaining more and more footing. However, resistance is still a significant challenge as it is likely to undo the gains made in the treatment of PUD since the 1980s.[10] There has been a change in the clinical spectrum of PUD. In H. pylori-infested populations where effective eradication efforts have been carried out, duodenal ulcers, which used to be much more common than gastric ulcers, have decreased in prevalence.[11] Conversely, gastric ulcers that are associated with the use of NSAIDs and comorbidities are comparatively more common.[12,13]

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Objective:

To analyze the current trends in PUD with respect to ulcer type, *H. pylori* status, and associated risk factors in a tertiary care setting.

Methodology:

This retrospective descriptive study was conducted at Shalamar Hospital, Lahore, from November 2023 to November 2025. A total of 285 patients were included in the study. Patients aged 18 years and above presenting with symptoms suggestive of peptic ulcer disease (e.g., epigastric pain, dyspepsia, upper gastrointestinal bleeding). Patients undergoing upper gastrointestinal endoscopy as part of their diagnostic evaluation were also included. While patients with past gastric surgery were not included in the study. Additionally, patients who had taken antibiotics, proton pump inhibitors (PPIs), or bismuth compounds in the past 4 weeks were excluded from the study because they may affect detection of H. pylori. Furthermore, patients who refused or were reluctant to give informed consent were not eligible for the study. Following a clinical evaluation, patients who visited the hospital throughout the study period and met the inclusion criteria underwent esophagogastroduodenoscopy (EGD). In terms of duodenal or stomach ulcers, the location, number, and categorization of ulcers were noted. During the endoscopy, biopsies from the stomach body and the stomach antrum were collected to evaluate the diagnosis. The *H. pylori* status was ascertained by histopathology and the rapid urease test (RUT). Demographic information, clinical presentation, risk factors (such as drinking, smoking, and NSAID usage), and endoscopic esults were recorded using a systematic proforma.

The Statistical Package for the Social Sciences (SPSS) version 26.0 was used to enter and analyze the data. Data for quantitative variables (age) were expressed as mean ± SD and data for categorical variables (gender, ulcer location, *H pylori* status, NSAID use) were presented as frequencies and percentage. For the association between categorical variables, the chi square test was used, while for continuous variables, the independent samples t test was used for comparison. The p-value set at < 0.05 was considered statistically significant.

Results:

A total of 285 patients were included, with a mean age of 46.8 ± 13.2 years (range: 18–78 years). There was a little male preponderance: 123 patients (43.2%) were female and 162 patients (56.8%) were male. The most frequent complaint was epigastric pain (n=207, 72.6%) followed by dyspepsia (n=54, 18.9%) and by upper gastrointestinal bleeding (n=24, 8.4%). Endoscopic examinations showed that duodenal ulcers occurred most commonly (58.9%), gastric ulcers (36.1%), and both gastric and duodenal ulcers were identified in 4.9%. Twenty percent of patients had complications, most frequently (8.4%) were those involving the upper digestive tract, followed by recurrent ulcer disease (5.3%), perforation (3.9%) and gastric outlet obstruction (2.5%).

Table No 1: Demographic characteristics of study population (N = 285).

Variable	Value
Age (year), mean ±SD	46.8 ± 13.2
Age range (years)	18 – 78
Male, n (%)	162 (56.8)
Female, n (%)	123 (43.2)
Epigastric pain, n (%)	207 (72.6)
Dyspepsia, n (%)	54 (18.9)
Upper GI bleeding, n (%)	24 (8.4)
Ulcer site	
Duodenal ulcer	168 (58.9)
Gastric ulcer	103 (36.1)
Combined gastric + duodenal	14 (4.9)
Complications	
Upper GI bleeding	24 (8.4)
Perforation	11 (3.9)
Gastric outlet obstruction	7 (2.5)
Recurrent ulcer disease	15 (5.3)
No complication	228 (80.0)

Overall, *H. pylori* infection was detected in 171 patients (60.0%). The prevalence was significantly higher among duodenal ulcer patients (68.5%) compared to those with gastric ulcers (48.5%) ($p = 0.002$). Patients with combined gastric and duodenal ulcers also showed a relatively high prevalence; with 9 out of 14 cases (64.3%) being *H. pylori* positive.

Table No 2: Association between ulcer type and *Helicobacter pylori* positivity.

Ulcer type	Total cases	*H. pylori* positive, n (%)	p-value
Duodenal ulcer	168	115 (68.5)	0.002 *
Gastric ulcer	103	50 (48.5)	
Combined gastric + duodenal	14	9 (64.3)	

*Chi-square test applied; statistically significant.

NSAID use was reported in 92 patients (32.3% overall), and was strongly associated with gastric ulcers, being present in 55 patients (53.4%) compared to 31 patients (18.5%) with duodenal ulcers and 6 patients (42.9%) with combined ulcers ($p = 0.01$). Smoking was documented in 68 patients (23.9%) and alcohol intake in 22 patients (7.7%), but neither factor showed a statistically significant association with ulcer type ($p = 0.65$ and $p = 0.21$, respectively).

Younger and middle-aged individuals were having duodenal ulcer (23.2% of patients aged 18–30 and 37.5% of patients aged 31–45). On the other hand, gastric ulcers were

more common in older individuals, with 24.3% of instances in patients over 60 and 35.0% in those between the ages of 46 and 60.

Table No 3: Risk factors associated with ulcer type.

Risk factor	Gastric ulcer (n=103)	Duodenal ulcer (n=168)	Combined (n=14)	p-value
NSAID use, n (%)	55 (53.4)	31 (18.5)	6 (42.9)	0.01*
Smoking, n (%)	24 (23.3)	39 (23.2)	5 (35.7)	0.65
Alcohol, n (%)	11 (10.7)	9 (5.4)	2 (14.3)	0.21

*Chi-square test applied; statistically significant.

Table No 4. Distribution of patients by age groups and ulcer type (N = 285)

Age group (years)	Gastric ulcer, n (%)	Duodenal ulcer, n (%)	Combined, n (%)	Total, n (%)
18–30	14 (13.6)	39 (23.2)	2 (14.3)	55 (19.3)
31–45	28 (27.2)	63 (37.5)	4 (28.6)	95 (33.3)
46–60	36 (35.0)	45 (26.8)	5 (35.7)	86 (30.2)
>60	25 (24.3)	21 (12.5)	3 (21.4)	49 (17.2)
Total	103 (100)	168 (100)	14 (100)	285 (100)

Among male patients, 101 of 162 (62.3%) were *H. pylori* positive, compared to 70 of 123 (56.9%) female patients. Although infection rates were slightly higher in males, the difference was not statistically significant (p = 0.41).

Table No 5: Gender-wise distribution of *Helicobacter pylori* positivity.

Gender	n	*H. pylori* positive, n (%)	*H. pylori* negative, n (%)	p-value
Male	162	101 (62.3)	61 (37.7)	0.41
Female	123	70 (56.9)	53 (43.1)	
Total	285	171 (60.0)	114 (40.0)	

Discussion:

This retrospective study of 285 patients offered significant insight into the changing trends in peptic ulcer disease (PUD) and the link between PUD and Helicobacter pylori infection in a tertiary care center. We discovered that duodenal ulcers are still more common than gastric ulcers, and that H. pylori infection is a major etiological factor, particularly in duodenal ulcer patients. The hypothesis that the epidemiology of PUD is evolving from a purely infectious disease to a multifactorial condition that is both microbial and iatrogenic is supported by the high rate of NSAID-association and gastric ulcers. The study's overall H. pylori infection prevalence of 60% is modest when compared to South Asian and other emerging regions' historical high prevalence rates of 70–80%. This is consistent with the global decline in H. pylori infection prevalence, which is linked to improved hygiene, improved socioeconomic status, and increased access to eradication treatments.[14] Nonetheless, the prevalence of H. pylori positivity in duodenal ulcer cases (68.5%) highlights the necessity of further efforts to eradicate H. pylori in order to remove the organism's clinical significance. Similar findings from regional studies indicate that the H. pylori-associated ulcer illness is declining but has not completely disappeared. Frequent use of NSAIDs was reported by more than half of the patients with stomach ulcers, and this was found to be a strong predictor in this study. This finding is consistent with the NSAID's ulcerogenic effect, which results from inhibiting prostaglandin synthesis and lowering the defense of the stomach mucosa. The prevalence of NSAID-associated ulcers has significantly increased worldwide due to the aging population and the widespread use of aspirin and NSAIDs to treat cardiovascular diseases [15]. Non-H. pylori and NSAID-associated ulcers are becoming more common in the industrialized world, according to reports from Europe and North America. Our results are consistent with those from other countries, suggesting that our population follows the same patterns. Gender/age-specific analyses [16,17] provide more details. The prevalence of H. pylori infection has not been found to differ significantly between genders in the global literature, but this study found that it is common in men. According to the age distribution, gastric ulcers were more common in older people, while duodenal ulcers were more common in younger and middle-aged people.[18]

This change in the prevalence of gastric ulcers in older patients may be due to a decrease in the prevalence of H. pylori in younger individuals and an increase in the usage of NSAIDS by older adults. Upper GI bleeding was the most frequent consequence of Peptic ulcer disease (in nearly 20% of patients with upper GI bleeding), followed by gastric outlet blockage and perforation. The findings can be contrasted with those of other retrospective studies in which the most frequent consequence was hemorrhage. Importantly, older patients were more likely to experience sequelae, including H. pylori ulcers and NSAID-associated ulcers, probably as a result of delayed illness onset, comorbidity, and polypharmacy.[19,20]

Limitation of study:

Due to the study's retrospective design, it only included medical records, which could have led to missing data and documentation bias. The inability to extrapolate the findings to a broader population is one drawback of the single center study. Rapid urease testing and histopathology were the only methods used for Helicobacter pylori microbiological confirmation; culture or molecular testing may have underestimated the resistance pattern. Additionally, there was a chance that NSAIDs and lifestyle variables (alcohol and smoking) might be underreported in self-report.

Conclusion:

Helicobacter pylori infection is strongly linked to the duodenal ulcer, while NSAID use is increasingly linked to gastric ulcers. Although the overall prevalence of *H pylori*, we

found, was 60%, it was still a significant etiological factor despite being lower than published results.

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Mariam Javed	Proof reading