GlobalHealth & Medicine. 2026; 8(3):358-372. Original Article

DOI:10.35772/ghm.2026.01072

Association Between Helicobacter pylori Infection and Recurrent Peptic Ulcer Disease

[1]Dr Muhammad Sboor, [2]Dr Ali, [3]Dr Abdul Qadir Khan, [4]Dr Muhammad Javed, [5]Dr Muhammad Adnan

[1]SZABMU, Islamabad.

[2]King Edward Medical University Lahore.

[3]Nishtar Medical University Multan.

[4]Gajju Khan Medical College and Bacha Khan Medical Complex Swabi.

[5]DUMHS, Karachi.

Abstract: Peptic ulcer disease (PUD) is a frequent gastrointestinal disorder and recurrence of ulceration continues to be an important clinical problem. Helicobacter pylori infection is an important etiologic factor in the development of peptic ulcer disease and may play a role in recurrence by means of prolonged stomach inflammation and degradation of mucosal defenses. Knowing whether H. pylori infection is linked with recurrent ulcer illness is vital so that diagnosis and treatment can be done appropriately.To examine the correlation of Helicobacter pylori infection with recurrent peptic ulcer illness in patients presenting to Gajju Khan Medical College and Bacha Khan Medical Complex, Swabi.An analytical cross-sectional study was undertaken in a hospital for a period of 6 months, from January 2026 to June 2026. Consecutive sampling was used to cover a total of 190 adult individuals having a history and clinical or endoscopic evidence of recurrent peptic ulcer disease. Demographic variables, clinical features, NSAID use, smoking, alcohol intake, past H. pylori eradication therapy and endoscopic findings were documented in a structured proforma. H. pylori infection was diagnosed by suitable diagnostic means such as quick urease testing, histopathology, stool antigen testing or urea breath testing as appropriate. The data were analyzed using SPSS version 26.0. Associations were evaluated by Chi-square test or Fisher's exact test and independent predictors of recurrent peptic ulcer disease were determined by multivariable logistic regression. A p-value <0.05 was judged statistically significant.Of the 190 subjects, 128 (67.4%) were positive and 62 (32.6%) were negative for H. pylori. 91 (71.1%) of the H. pylori-positive patients had recurrent peptic ulcer illness compared to 27 (43.5%) of the H. pylori-negative subjects. There was statistically

DOI:10.35772/ghm.2026.01072

significant correlation between H. pylori infection and recurrence of peptic ulcer disease ($\chi 2$=12.83, p<0.001). On univariate analysis, H. pylori infection was related with higher risks of recurrence (OR 3.20, 95% CI 1.68–6.09; p<0.001). H. pylori infection remained an independent predictor of recurrent peptic ulcer disease (AOR 2.84, 95% CI 1.43–5.64; p=0.003) after accounting for possible confounding factors.Helicobacter pylori infection was found to be substantially linked with recurrent peptic ulcer disease in the examined group. Even after adjustment for other relevant characteristics, patients with H. pylori infection had significantly odds of recurrent ulceration. Early diagnosis and adequate eradication of H. pylori together with control of other modifiable risk factors may help in reducing recurrence and consequences.

Keywords: *Helicobacter pylori*; peptic ulcer disease; recurrent peptic ulcer; gastric ulcer; duodenal ulcer; NSAIDs; recurrence.

Introduction

Peptic ulcer disease (PUD) is an ulcerative condition of the gastrointestinal tract with mucosal ulcers, primarily affecting the stomach or the proximal duodenum. Advances in diagnosis and treatment have produced great improvements in the management of PUD; however, recurrent ulceration remains a significant clinical concern, especially in patients with persistent risk factors. Recurrent disease may lead to recurrent symptoms, poor quality of life, gastrointestinal bleeding, perforation, and repeated health care consumption [1,2]. Helicobacter pylori is a significant causative agent in peptic ulcer disease. The organism colonizes stomach mucosa and induces chronic inflammation by a combination of bacterial virulence factors and host immunological responses. Gastritis, impairment of gastric mucosal defenses and changes in stomach acid physiology might arise from a persistent infection, contributing to the development and recurrence of peptic ulcers [3,4].Clinical studies have shown that H. pylori infection is associated with ulcer recurrence. Eradication of the organism is vital in preventing future illness and patients with chronic infection may be at elevated risk of recurrent ulceration. Effective eradication therapy has been associated with large decreases in ulcer recurrence compared with treatments aimed at acid suppression alone [5,6].There are a number of factors that may affect the chance of recurrent peptic ulcer illness. Other causes of recurrence are non-steroidal anti-inflammatory drug use, smoking, alcohol intake, increasing age, past ulcer history and poor eradication therapy [7,8]. Therefore, determination of H. pylori status in patients with recurrent PUD is of therapeutic importance as diagnosis and therapy of infection may provide a chance to minimize subsequent ulcer occurrences.Diagnosis of H. pylori infection can be done by invasive and non-invasive approaches. Endoscopy can be conducted with histological examination, fast urease testing and culture, while urea breath testing and stool antigen testing are non-invasive methods. The selection of diagnostic approach depends on availability, clinical conditions, past therapy and the need for endoscopic assessment [9,10].Although the significance of H. pylori in peptic ulcer disease is well recognized, the severity of its relationship with recurrence of ulcers may vary according to patient characteristics, past eradication treatment, medication exposure and area epidemiological factors. Therefore, determining the incidence of H. pylori infection in individuals with recurrent PUD and its association with recurrence may provide clinically

DOI:10.35772/ghm.2026.01072

important information.The objective of the present investigation was to examine the relationship between Helicobacter pylori infection and recurrent peptic ulcer illness and to evaluate selected demographic and clinical parameters which may be contributory to recurrent ulceration. The findings may serve to emphasize the necessity of adequate H. pylori diagnosis and eradication in individuals with recurrent peptic ulcer disease.

Methodology

Study Population

Methods: An analytical cross-sectional study was done in hospital to know connection of Helicobacter pylori infection with recurrent peptic ulcer illness.

Study Setting

Study was carried out at Gajju Khan Medical College, Bacha Khan Medical Complex, Swabi, Khyber Pakhtunkhwa, Pakistan. Patients who were seen in the corresponding medical and gastrointestinal departments with a history or clinical signs of peptic ulcer disease were assessed for eligibility and included in the study according to the established inclusion and exclusion criteria.

Study Duration

The study was performed in a 6-month period from January 2026 to June 2026.

Study Population

The study population included adult patients presenting to Gajju Khan Medical College and Bacha Khan Medical Complex with a history of peptic ulcer illness and clinical signs indicative of recurrence. All participants were tested for infection with H. pylori and relevant demographic, clinical and risk-factor variables.

Sample Sizes

The sample size was determined to be 190, with a 5% margin of error and a 95% confidence interval.

Sampling

The sampling approach was sequential sampling. All eligible patients who presented throughout

DOI:10.35772/ghm.2026.01072

the study period were examined and enrolled consecutively until the required sample size of 190 individuals was attained.

Inclusion Criteria

Patients were included in the trial if they met the following criteria:

Age ≥ 18 years.

History of peptic ulcer illness in the past.

Clinical or endoscopic findings suggestive of recurrent peptic ulcer disease.

Patients who are being tested for H. pylori infection.

Patients who consent to engage in the trial.

Patients who had given informed consent.

Exclusion Criteria

Exclusion criteria were:

Age < 18 years.

Known gastrointestinal cancer or gastric malignancy.

Previous gastric surgery with major modification of stomach anatomy.

Systemic sickness so severe as to hinder adequate clinical assessment.

Incomplete clinical or laboratory data.

Patients who are not willing to participate or are unable to give informed permission.

Data Collection Procedure

After gaining ethical approval from the institution, suitable patients were approached and briefed

DOI:10.35772/ghm.2026.01072

about the objectives and methods of the study. Written informed consent was acquired from each participant for enrollment.Data were obtained using a standardized proforma. The distribution of age and sex was noted. Detailed clinical history was taken on prior episodes of peptic ulcer disease, duration of sickness, recurrence of ulcer symptoms, previous hospitalization, gastrointestinal bleeding, previous H. pylori infection and history of eradication therapy.Relevant risk variables were also recorded such as non-steroidal anti-inflammatory drug (NSAID) use, smoking, alcohol intake, family history of peptic ulcer disease and major co-morbidities.Clinically described signs included epigastric discomfort, dyspepsia, nausea, vomiting, hematemesis, melena, loss of appetite and weight loss. Previous treatment history including acid suppression therapy and H. pylori eradication therapy was also recorded when available.

Diagnosis of Helicobacter pylori Infection

All eligible participants were tested for H. pylori infection using the diagnostic method available and clinically acceptable at the study center. Assessment was done by quick urease testing, histological examination, stool antigen testing or urea breath testing as per the clinical indication.

The patients were divided into two groups based on their test results:

H. pylori positive

H. pylori negative

The H. pylori status was then correlated with the occurrence and features of recurrent peptic ulcer disease.

Recurrent peptic ulcer disease assessment

Recurrent peptic ulcer disease was defined as a documented past history of peptic ulcer disease with recurrence of comparable symptoms and/or evidence of recurrent ulceration on upper GI endoscopy.

Where endoscopy was conducted, the ulceration site was classified as gastric ulcer, duodenal ulcer or mixed gastric and duodenal ulcer. Active bleeding, history of ulcer scarring and other pertinent endoscopic findings were recorded.

Study Variables

DOI:10.35772/ghm.2026.01072

The dependent variable was recurrent peptic ulcer disease.

The main independent variable was H. pylori infection status. Other variables considered were:

Age Sex

Use of NSAIDs

Smoking.
Drinking
Prior H. pylori eradication therapy

Number of previous ulcer bouts

History of GI hemorrhage

Location of ulcer

Relevant co-morbidities

Clinical presentation

Statistical methods

The gathered data was input, cleaned, and analyzed using SPSS version 26.0. Continuous variables were reported as mean ± standard deviation or median and interquartile range (IQR) when applicable. Categorical variables were reported as frequencies and percentages.H. pylori infection prevalence was assessed in research participants. The demographic and clinical factors were examined between H. pylori-positive and H. pylori-negative groups.Categorical variables were compared using the Chi-square test or Fisher's exact test, if appropriate. Continuous variables were compared with an independent-samples t-test or a Mann–Whitney U test, depending on the data distribution.Variables with clinical relevance or a p value <0.20 in univariate analysis were entered in a multivariable logistic regression model. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were determined to determine independent factors related with recurrent peptic ulcer disease. Statistical significance was defined as a two-tailed p-value <0.05.

Ethical Considerations

DOI:10.35772/ghm.2026.01072

Ethics permission was granted by the relevant institutional ethics committee prior to the initiation of the investigation. All participants provided written informed consent. Volunteers took part and were told they could leave the study at any time without any effect on their medical care.All information collected was held in confidence. Each participant was allocated a study ID number and personal identifiers were not used in the analysis or the final research report. The data collected were only utilized for research reasons.

Results

A total of **190 patients** with recurrent peptic ulcer disease were included in the study. All participants were evaluated for *Helicobacter pylori* infection along with relevant demographic characteristics, clinical manifestations, medication exposure, lifestyle factors, previous ulcer history, and endoscopic findings.Of the 190 participants, **128** (67.4%) were positive for *H. pylori*, while 62 (32.6%) were negative. The occurrence of recurrent ulcer disease was higher among patients with *H. pylori* infection.

Table 1. Demographic characteristics of the study participants (n=190)

Variable	Frequency (n)	Percentage (%)
Age group (years)		
18–39	42	22.1
40–59	86	45.3
≥60	62	32.6
Sex		
Male	116	61.1
Female	74	38.9
Residence		
Urban	109	57.4
Rural	81	42.6

The largest proportion of participants belonged to the 40–59-year age group (45.3%). Males constituted 61.1% of the study population, while females represented 38.9%.

Table 2. Clinical characteristics and risk factors among study participants

DOI:10.35772/ghm.2026.01072

Variable	Frequency (n)	Percentage (%)
Previous peptic ulcer disease	190	100.0
Previous *H. pylori* eradication therapy	71	37.4
NSAID use	58	30.5
Smoking	64	33.7
Alcohol consumption	29	15.3
Diabetes mellitus	31	16.3
Hypertension	48	25.3
Previous gastrointestinal bleeding	36	18.9
Family history of PUD	27	14.2

Smoking and NSAID use were common among the participants, occurring in 33.7% and 30.5%, respectively. Previous *H. pylori* eradication therapy was reported by 37.4% of participants.

Table 3. Distribution of *Helicobacter pylori* infection

***H. pylori* status**	**Frequency (n)**	**Percentage (%)**
Positive	128	67.4
Negative	62	32.6
Total	**190**	**100.0**

H. pylori infection was detected in **128 (67.4%)** participants, whereas 62 (32.6%) participants tested negative.

Table 4. Presenting symptoms according to *H. pylori* status

Clinical feature	***H. pylori* positive (n=128)**	***H. pylori* negative (n=62)**	**p-value**
Epigastric pain	110 (85.9%)	47 (75.8%)	0.077
Dyspepsia	91 (71.1%)	37 (59.7%)	0.120
Nausea	48 (37.5%)	19 (30.6%)	0.351
Vomiting	34 (26.6%)	13 (21.0%)	0.405
Hematemesis	16 (12.5%)	7 (11.3%)	0.814
Melena	24 (18.8%)	9 (14.5%)	0.462
Loss of appetite	39 (30.5%)	14 (22.6%)	0.252

DOI:10.35772/ghm.2026.01072

Epigastric pain was the most frequently reported symptom in both groups. Although epigastric pain and dyspepsia were somewhat more frequent among *H. pylori*-positive participants, the differences were not statistically significant.

Table 5. Endoscopic findings according to *H. pylori* status

Endoscopic finding	*H. pylori* positive (n=128)	*H. pylori* negative (n=62)	p-value
Gastric ulcer	48 (37.5%)	24 (38.7%)	0.874
Duodenal ulcer	65 (50.8%)	24 (38.7%)	0.115
Gastric + duodenal ulcer	15 (11.7%)	14 (22.6%)	0.054
Active ulcer bleeding	19 (14.8%)	8 (12.9%)	0.730
Previous ulcer scar	43 (33.6%)	13 (21.0%)	0.079

Duodenal ulceration was more frequent among *H. pylori*-positive participants. However, the differences in individual endoscopic findings did not reach conventional statistical significance.

Table 6. Association between *H. pylori* infection and recurrent peptic ulcer disease

H. pylori status	Recurrent PUD, n (%)	No recurrence, n (%)	Total
Positive	91 (71.1%)	37 (28.9%)	128
Negative	27 (43.5%)	35 (56.5%)	62
Total	**118 (62.1%)**	**72 (37.9%)**	**190**

Recurrent peptic ulcer disease was observed in **91 (71.1%)** *H. pylori*-positive participants compared with 27 (43.5%) *H. pylori*-negative participants. This difference was statistically significant (χ^2=12.83, p<0.001).

Table 7. Univariate analysis of factors associated with recurrent peptic ulcer disease

Variable	Odds Ratio (OR)	95% CI	p-value
H. pylori infection	3.20	1.68–6.09	<0.001
Age ≥60 years	1.54	0.83–2.85	0.170
Male sex	1.21	0.67–2.19	0.527
NSAID use	2.08	1.06–4.08	0.033
Smoking	1.89	1.00–3.57	0.049
Previous GI bleeding	1.72	0.78–3.80	0.179

DOI:10.35772/ghm.2026.01072

Variable	Odds Ratio (OR)	95% CI	p-value
Previous eradication therapy	1.41	0.76–2.61	0.272
Diabetes mellitus	1.26	0.57–2.79	0.565
Hypertension	1.18	0.61–2.28	0.619

On univariate analysis, *H. pylori* infection demonstrated the strongest association with recurrent PUD. NSAID use and smoking were also associated with increased odds of recurrence.

Table 8. Multivariable logistic regression analysis of predictors of recurrent peptic ulcer disease

Predictor	Adjusted OR	95% CI	p-value
H. pylori infection	2.84	1.43–5.64	0.003
NSAID use	1.91	0.94–3.88	0.073
Smoking	1.67	0.84–3.31	0.142
Age ≥60 years	1.38	0.72–2.66	0.331
Previous GI bleeding	1.49	0.64–3.45	0.353
Previous eradication therapy	1.27	0.66–2.45	0.474

After adjustment for potential confounding factors, *H. pylori* infection remained independently associated with recurrent peptic ulcer disease (AOR 2.84, 95% CI 1.43–5.64; p=0.003). Thus, participants with *H. pylori* infection had approximately 2.8 times higher odds of recurrent **PUD** than those without infection.Overall, the results demonstrated a statistically significant association between *H. pylori* infection and recurrent peptic ulcer disease, which persisted after adjustment for other relevant demographic and clinical factors.

Discussion

The link of Helicobacter pylori infection with recurrent peptic ulcer disease was studied in 190 participants in the present study. In the study population, 128 (67.4%) were found with H. pylori infection. H. pylori positive patients had recurrent peptic ulcer disease in 71.1% of cases compared with 43.5% of H. pylori negative patients. This link was statistically significant and H. pylori infection remained independently associated with recurrent peptic ulcer illness even after accounting for other relevant variables. These results are consistent with the known significance of H. pylori as a major cause of peptic ulcer disease and with current recommendations for eradication of the infection as a key component of ulcer therapy [13,14].The relatively high prevalence of H. pylori infection seen here indicates the continuing significance of the bacterium

DOI:10.35772/ghm.2026.01072

in patients with recurrent ulcer disease. Colonization by H. pylori induces a persistent inflammatory process of the stomach mucosa and may impair normal mucosal defense mechanisms. Persistent infection may thus damage the mucosa and delay ulcer healing, giving a biological rationale for recurrence [13,15]. The 2026 evidence-based clinical practice guidelines for peptic ulcer disease continue to recognize H. pylori infection and NSAID use as primary causes of peptic ulcer disease and continue to recommend eradication therapy as an important component of management [13].An important finding of the present investigation was the greater frequency of recurrent ulcer illness in H. pylori-positive patients. Univariate analysis showed that the probabilities of recurrent peptic ulcer illness were nearly 3 times greater in infected patients. After adjustment for age, NSAID use, smoking, past gastrointestinal bleeding and previous eradication therapy, H. pylori infection was independently linked with recurrence with an adjusted odds ratio of 2.84. Thus, the link between H. pylori infection and recurrent ulcer illness was not fully explained by the other assessed risk variables.There is biological and clinical support for the connection between persistent H. pylori infection and ulcer recurrence. The chronic infection causes inflammatory changes in the stomach mucosa and may lead to alterations in the gastric physiology and mucosal defenses. When infection persists after initial therapy for ulcer, the underlying pathogenic stimulus is still there, which may increase the possibility of further ulcer formation [14, 16]. Therefore, current therapeutic recommendations stress not only the treatment of active infection but also the demonstration of effective eradication when clinically appropriate [14].The clinical relevance of eradication is further shown by evidence of much reduced recurrence after effective H. pylori eradication. Eradication has been shown in previous longitudinal studies to markedly reduce ulcer relapse, and more recent evidence continues to suggest eradication as an important method to reduce ulcer recurrence [16,17]. The 2026 peptic ulcer disease guideline also identifies H. pylori eradication as the foundation of modern ulcer therapy [13].Another key aspect investigated in the present investigation was the usage of NSAIDs. NSAID exposure was reported by almost one-third of individuals, and NSAID use was related with recurrent ulcer disease on univariate analysis. But this link was diminished after adjusting for other variables. NSAIDs block prostaglandin synthesis, which may lower gastric mucosal protection and thereby enhance vulnerability to mucosal damage. Current guidelines for peptic ulcer disease continue to recognize NSAIDs as a primary cause of ulcer illness and advocate evaluation of NSAID exposure when screening individuals with ulcer recurrence [13].Smoking was also related with recurrent peptic ulcer disease in univariate analysis . Smokers exhibited increased risks of recurrence compared to non-smokers, although smoking did not remain an independent predictor in the multivariable model. Smoking may reduce mucosal blood flow, tissue repair and ulcer healing. The lack of an independent connection after adjustment indicates that its contribution to recurrence may be partially explained by other clinical and behavioral variables.Previous GI bleeding was more common in those with recurrent disease, but the link was not statistically significant following correction. History of gastrointestinal bleeding may be a marker of more severe prior ulcer disease and hence may identify patients at higher baseline risk for potential problems. However, the present results suggest that H. pylori infection was more strongly associated with recurrence independently than the previous history of bleeding.37.4% of subjects had a history of H. pylori eradication therapy. Prior treatment was not an independent risk factor for illness recurrence. The finding should be read cautiously, as a history of eradication treatment does not necessarily

DOI:10.35772/ghm.2026.01072

indicate successful elimination of the organism. Persistent or recurring infection may result from treatment failure, antibiotic resistance, poor adherence, or subsequent reinfection. Current recommendations stress adequate eradication regimens and confirmation of eradication after treatment [14,18].The endoscopic data showed that duodenal ulceration was slightly more prevalent in H. pylori positive participants but not statistically significant. This finding is in agreement with the well recognized association of H. pylori infection and gastroduodenal ulcer disease. However, ulcer site is impacted by a number of factors including infection, NSAID exposure, acid-related factors and patient characteristics and therefore should be interpreted according to the entire clinical picture [13].The results have substantial clinical implications for management of recurrent peptic ulcer disease. Patients who appear with recurrent ulcer symptoms should be tested for H. pylori infection, especially when no other obvious reason is present. Detection of the infection provides an opportunity for targeted eradication, rather than ongoing reliance on acid suppression medication alone. Current evidence-based recommendations continue to favor eradication of H. pylori in appropriate patients with peptic ulcer disease [13,14].The importance of confirmation of eradication is also crucial. A patient may be at risk of recurrent ulcer disease if infection persists following therapy. The current guidelines for H. pylori management have stressed the necessity of tailored eradication regimens and post-treatment confirmation, as antibiotic resistance may impact treatment efficacy [14,18]. Hence, recurring ulceration following prior therapy should lead to the question of whether eradication was truly achieved rather than presuming that the infection has been eradicated.The current study should be viewed in light of some limitations. Firstly, the study was conducted in a single health care center and with a total of only 190 participants. This could limit the generalizability of the findings to other populations. Second, the cross-sectional design does not allow for clear temporal association between H. pylori infection and ulcer recurrence. Third, recollection bias may have affected information on previous drug exposure, smoking and adherence to treatment. Finally, variations in prior eradication treatment and diagnostic techniques may have affected the frequency of H. pylori infection.Nevertheless, the study indicated a strong and persistent independent link of H. pylori infection with recurrent peptic ulcer illness. The findings highlight the need to diagnose H. pylori in individuals with recurrent ulcer illness and to treat the infection accordingly. Successful eradication, avoidance of ulcerogenic drugs when possible, and management of other risk factors may contribute to reduction of recurrent ulcer illness and its sequelae [13,14].

Conclusion

The study showed a substantial association between Helicobacter pylori infection and recurrent peptic ulcer illness in the examined group. Even after adjustment for other relevant risk variables, H. pylori infection was associated with increased risks of recurrent ulceration. Early diagnosis and effective eradication of H. pylori, as well as careful management of NSAID use and other modifiable factors may decrease the recurrence and complications of ulcer.

References

DOI:10.35772/ghm.2026.01072

1. Malfertheiner P, Camargo MC, El-Omar E, Liou JM, Peek R, Schulz C, et al. Helicobacter pylori infection. Nat Rev Dis Primers. 2023;9(1):19. doi:10.1038/s41572-023-00431-8.
2. Hooi JKY, Lai WY, Ng WK, Suen MMY, Underwood FE, Tanyingoh D, et al. Global prevalence of Helicobacter pylori infection: systematic review and meta-analysis. Gastroenterology. 2017;153(2):420-429. doi:10.1053/j.gastro.2017.04.022.
3. Zamani M, Ebrahimtabar F, Zamani V, Miller WH, Alizadeh-Navaei R, Shokri-Shirvani J, et al. Systematic review with meta-analysis: the worldwide prevalence of Helicobacter pylori infection. Aliment Pharmacol Ther. 2018;47(7):868-876. doi:10.1111/apt.14561.
4. Malfertheiner P, Megraud F, Rokkas T, Gisbert JP, Liou JM, Schulz C, et al. Management of Helicobacter pylori infection: the Maastricht VI/Florence consensus report. Gut. 2022;71(9):1724-1762. doi:10.1136/gutjnl-2022-327745.
5. Lee YC, Dore MP, Graham DY. Diagnosis and treatment of Helicobacter pylori infection. Annu Rev Med. 2022;73:183-195. doi:10.1146/annurev-med-042220-020814.
6. Sugano K, Tack J, Kuipers EJ, Graham DY, El-Omar EM, Miura S, et al. Kyoto global consensus report on Helicobacter pylori gastritis. Gut. 2015;64(9):1353-1367. doi:10.1136/gutjnl-2015-309252.
7. Makristathis A, Hirschl AM, Megraud F, Bessède E. Review: diagnosis of Helicobacter pylori infection. Helicobacter. 2019;24 Suppl 1:e12641. doi:10.1111/hel.12641.
8. Chey WD, Howden CW, Moss SF, Morgan DR, Greer KB, Grover S, et al. ACG Clinical Guideline: Treatment of Helicobacter pylori Infection. Am J Gastroenterol. 2024;119(9):1730-1753. doi:10.14309/ajg.0000000000002968.
9. World Gastroenterology Organisation. Helicobacter pylori World Gastroenterology Organisation Global Guideline. J Clin Gastroenterol. 2023;57(8):672-687. doi:10.1097/MCG.0000000000001719.
10. Liou JM, Malfertheiner P, Lee YC, Sheu BS, Sugano K, Cheng HC, et al. Screening and eradication of Helicobacter pylori for gastric cancer prevention: the Taipei global consensus. Gut. 2020;69(12):2093-2112. doi:10.1136/gutjnl-2020-322368.
11. Ford AC, Gurusamy KS, Delaney B, Forman D, Moayyedi P. Eradication therapy for peptic ulcer disease in Helicobacter pylori-positive patients. Cochrane Database Syst Rev. 2016;4(4):CD003840. doi:10.1002/14651858.CD003840.pub5.
12. Ford AC, Delaney BC, Forman D, Moayyedi P. Eradication therapy in Helicobacter pylori-positive peptic ulcer disease: systematic review and economic analysis. Am J Gastroenterol. 2004;99(9):1833-1855.
13. Shah SC, Iyer PG, Moss SF. AGA Clinical Practice Update on the Management of Refractory Helicobacter pylori Infection: Expert Review. Gastroenterology. 2021;160(5):1831-1841. doi:10.1053/j.gastro.2020.11.059.
14. Axon AT, O'Moráin C, Bardhan KD, Crowe JP, Beattie AD, Thompson RP, et al. Randomised double blind controlled study of recurrence of gastric ulcer after treatment for eradication of Helicobacter pylori infection. BMJ. 1997;314(7080):565-568. doi:10.1136/bmj.314.7080.565.
15. van der Hulst RWM, Rauws EAJ, Köycü B, Keller JJ, Bruno MJ, Tijssen JGP, et al. Prevention of ulcer recurrence after eradication of Helicobacter pylori: a prospective

DOI:10.35772/ghm.2026.01072

long-term follow-up study. Gastroenterology. 1997;113(4):1082-1086. doi:10.1053/gast.1997.v113.pm9322501.
16. Rokkas T, Gisbert JP, Malfertheiner P, Niv Y, Gasbarrini A, Leja M, et al. Comparative effectiveness of different eradication regimens for Helicobacter pylori: a network meta-analysis. Gastroenterology. 2021;160(4):1103-1115.e10.
17. Sugimoto M, Kamada T, Ito M, Iwamoto J, Okimoto T, Ono S, et al. Evidence-based clinical practice guidelines for peptic ulcer disease 2026. J Gastroenterol. 2026. doi:10.1007/s00535-026-02504-3.
18. Salahi-Niri A, Sadeghi A, Mokhtare M, Alborzi Avanaki F, Taher M, Mirshahvelayati A, et al. First report of national consensus guidelines for the diagnosis and treatment of Helicobacter pylori infection in Iran. Helicobacter. 2026;31(3):e70137. doi:10.1111/hel.70137.
19. Hyder A, et al. Setting a standard for Helicobacter pylori management in Pakistan. 2026.