Journal of Pathology of Nepal (2025) Vol. **15**, 2369 - 2374

Journal of
PATHOLOGY
of Nepal

www.acpnepal.com

Original Article

Correlation between histopathological and endoscopic findings in upper gastrointestinal biopsies of dyspeptic patients: A cross-sectional study

Niraj Nepal[1], Oshan Shrestha[1], Prabesh Choudhary[1], Khusboo Priya[2]

[1]*Department of Pathology, Nobel Medical College, Biratnagar, Nepal*
[2]*Department of Gastroeneterology, Nobel Medical College, Biratnagar, Nepal*

Keywords:

Dyspepsia, Endoscopy; Gastritis, Gastric ulcer; Helicobacter pylori

ABSTRACT

Background: Dyspepsia is a common clinical problem with a wide differential diagnosis, and the patterns of upper gastrointestinal mucosal disease vary across regions. Correlating endoscopic impressions with histopathological findings is essential for accurate diagnosis, particularly in settings where Helicobacter pylori infection remains prevalent. The study aimed to evaluate the spectrum of upper gastrointestinal mucosal lesions in dyspeptic patients and determine the correlation between endoscopic and histopathological diagnoses.

Materials and Methods: This cross-sectional observational study included 358 adult dyspeptic patients who underwent upper gastrointestinal endoscopy with targeted mucosal biopsies at Nobel Medical College, Nepal. Endoscopic impressions were compared with corresponding histopathological findings, and Helicobacter pylori positivity was assessed using routine and special stains.

Results: The mean patient age was 44.9, with a peak in the fourth decade; males comprised 58.9%. Erythematous or nodular gastritis was the most common endoscopic finding (50.3%). Histology showed chronic non-specific gastritis as the predominant lesion (33.0%), followed by gastric ulcer (15.1%) and chronic active gastritis (14.5%). H. pylori was prevalent in 40.8%, with the highest rates in chronic active gastritis (90.4%) and gastric ulcer (64.8%). Concordance between endoscopic and histopathologic findings was excellent for gastric and duodenal ulcers as well as malignant lesions, all endoscopically suspected malignancies were confirmed on biopsy.

Conclusions: Most dyspeptic patients had benign inflammatory pathology, and combining endoscopy with histopathology significantly improved diagnostic accuracy. Helicobacter pylori infection remained strongly associated with active gastritis and ulcer disease. Endoscopic biopsy continues to play a central role in evaluating dyspepsia in regional clinical practice.

Correspondence:
Dr. Niraj Nepal, MD
Associate Professor,
Department of Pathology, Nobel Medical College, Biratnagar, Nepal
ORCID iD: 0000-0001-5863-5445
Email address-nepalniraj@gmail.com

Received : January 25th, 2026; **Accepted :** February 10th, 2026

Citation: Nepal N, Shrestha O, Choudhary P, Priya K. Correlation between histopathological and endoscopic findings in upper gastrointestinal biopsies of dyspeptic patients: A cross-sectional study. J Pathol Nep 2025;15(2):2369-74. DOI: 10.3126/jpn.v15i2.89907

DOI: 10.3126/jpn.v15i2.89907

INTRODUCTION

Dyspepsia is a common clinical complaint encountered in both general medical practice and gastroenterology. It is characterized by persistent or recurrent epigastric discomfort, postprandial fullness, bloating, early satiety, or related upper gastro-intestinal (GI) symptoms. Globally, dyspepsia accounts for approximately 4–5% of primary care consultations and up to 40% of specialist gastroenterology visits.[1,2]

The symptom complex may arise from a wide spectrum of conditions ranging from benign inflammatory disorders, such as nonspecific gastritis, to clinically significant lesions including peptic ulcer disease, premalignant changes, and gastrointestinal malignancies. This broad etiological range highlights the importance of accurate diagnostic modalities capable of distinguishing functional from organic disease.

Upper gastrointestinal endoscopy, supported by targeted mucosal biopsy, has become the accepted diagnostic standard for evaluating dyspepsia, owing to its ability to directly visualize mucosal pathology and obtain tissue for microscopic evaluation.[3] Since the introduction of fiber-optic endoscopy, diagnostic precision has improved considerably through correlation of macroscopic findings with histology.[4]

Among the recognized causes of dyspepsia, *Helicobacter pylori* infection remains a major etiological factor. This Gram-negative bacterium is strongly associated with chronic active gastritis, peptic ulcer disease, mucosa-associated lymphoid tissue lymphoma, and gastric adenocarcinoma.[5,6] Global estimates indicate that *H. pylori* infects more than 50% of the world's population, with particularly high prevalence in South Asian countries, including Nepal.[7] Histopathological patterns linked with *H. pylori*–related injury range from chronic inflammation to atrophy, intestinal metaplasia, and dysplasia.[8]

Although endoscopy provides valuable macroscopic information, its diagnostic accuracy is significantly enhanced by histopathological examination. However, region-specific data correlating endoscopic impressions with histological diagnoses remain limited in Eastern Nepal. This study, therefore, aimed to evaluate the histopathological spectrum of upper GI mucosal lesions in dyspeptic patients and assess the degree of concordance between endoscopic and histological findings.

MATERIALS AND METHODS

This cross-sectional observational study was conducted over one year (December 2024 to November 2025) in the Department of Gastroenterology at Nobel Medical College and Teaching Hospital, Biratnagar, Nepal.

Adult patients (≥18 years) presenting with dyspeptic symptoms and undergoing upper GI endoscopy were included after obtaining written informed consent. Poorly preserved specimens, improperly labeled samples, and biopsies from cases without documented endoscopic findings were excluded.

Endoscopic examinations were performed using a standard video endoscope. The esophagus, stomach, and duodenum were systematically examined, and mucosal abnormalities such as erythema, erosions, ulcerations, nodularity, polyps, and masses were documented. Targeted biopsies were obtained from abnormal areas. Additional biopsies were taken when required for assessment of *H. pylori*.

Specimens were fixed in 10% neutral buffered formalin and processed according to standard histopathological protocols. Sections (3–4 µm thick) were stained with hematoxylin and eosin. Special stains (e.g., giemsa) were used when necessary to detect *H. pylori*. Histopathological evaluation included assessment of inflammatory pattern and severity, glandular atrophy, intestinal metaplasia, dysplasia, neoplastic changes, and the presence of *H. pylori*.

Endoscopic impressions were compared with histopathological diagnoses to determine concordance. Discordant cases were reviewed jointly by gastroenterologists and pathologists.

Data were analyzed using SPSS version 26. Continuous variables were expressed as mean ± standard deviation, and categorical variables as frequencies and percentages. The chi-square test, one-way ANOVA, and paired t-test were applied as appropriate. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 358 upper GI biopsy specimens were analyzed. The mean age was 44.93 ± 14.53 years (median 42; range 18–82 years). The largest age group was 31–40 years (32.7%). Males accounted for 58.9% of cases (male-to-female ratio 1.4:1) (Table 1).

Table 1: Age-wise distribution of GI lesions (n = 358)

Age Group	Female [n (%)]	Male [n (%)]	Total [n (%)]
18-30 years	17 (40.5%)	25 (59.5%)	42 (11.7%)
31-40 years	47 (40.2%)	70 (59.8%)	117 (32.7%)
41-50 years	41 (46.6%)	47 (53.4%)	88 (24.6%)
51-60 years	22 (33.3%)	44 (66.7%)	66 (18.4%)
>60 years	20 (44.4%)	25 (55.6%)	45 (12.6%)
Total	147 (41.1%)	211 (58.9%)	358 (100%)

The stomach was the most frequently biopsied site, followed by the esophagus and duodenum. (fig.1)

Nodular gastritis was the most common endoscopic finding (50.3%), followed by gastric ulcer (15.1%) and erosive esophagitis (13.4%). (fig.2)

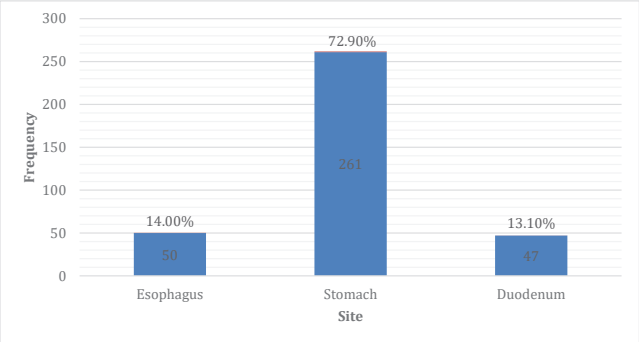

Figure 1: *Distribution of endoscopic biopsy sites*

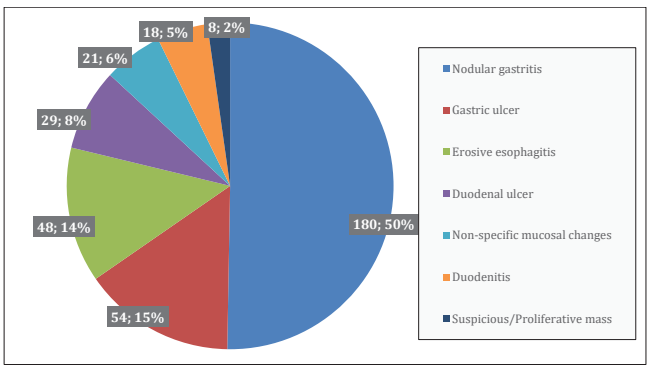

Figure 2: *Distribution of endoscopic findings in upper gastrointestinal examinations*

Histopathologically, chronic inactive gastritis was the predominant lesion (33.0%), followed by gastric ulcer (15.1%) and chronic active gastritis (14.5%). Adenocarcinoma and squamous cell carcinoma accounted for 1.7% and 0.6% of cases, respectively (fig.3).

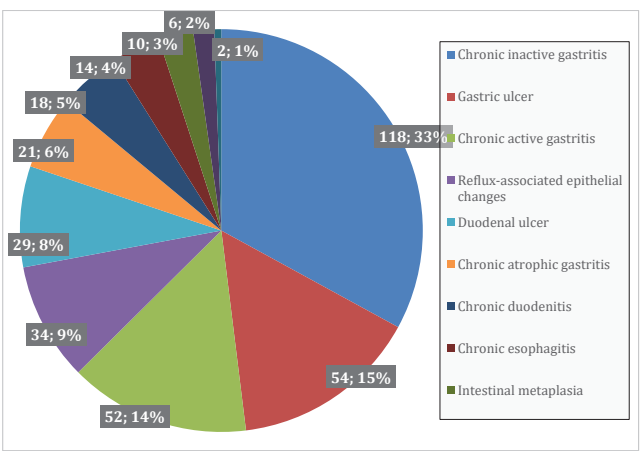

Figure 3: *Distribution of histopathological diagnosis in upper gastrointestinal biopsy*

Table 2: Prevalence of H. pylori in relation to endoscopy findings

Endoscopic findings	H. pylori		Total
	Positive	Negative	
Nodular gastritis	81 (45.0%)	99 (55.0%)	180 (50.3%)
Gastric ulcer	35 (64.8%)	19 (35.2%)	54 (15.1%)
Erosive esophagitis	5 (10.4%)	43 (89.6%)	48 (13.4%)
Duodenal ulcer	13 (44.8%)	16 (55.2%)	29 (8.1%)
Non-specific mucosal changes	7 (33.3%)	14 (66.7%)	21 (5.9%)
Duodenitis	3 (16.7%)	15 (83.3%)	18 (5.0%)
Suspicious/ Proliferative mass	2 (25.0%)	6 (75.0%)	8 (2.2%)
Total	146 (40.8%)	212 (59.2%)	358 (100%)

The overall prevalence of *Helicobacter pylori* infection was 40.8%. As summarized in Table 2, positivity was highest among cases with gastric ulcer (64.8%), followed by nodular gastritis (45.0%) and duodenal ulcer (44.8%). In contrast, low detection rates were observed in erosive esophagitis (10.4%) and reflux-associated epithelial changes (11.8%).

Table 3: Prevalence of H. pylori in relation to histopathological diagnosis

Histopathological diagnosis	H. pylori		Total
	Positive	Negative	
Chronic inactive gastritis	29 (24.6%)	89 (75.4%)	118 (33.0%)
Gastric ulcer	35 (64.8%)	19 (35.2%)	54 (15.1%)
Chronic active gastritis	47 (90.4%)	5 (9.6%)	52 (14.5%)
Reflux-associated epithelial changes	4 (11.8%)	30 (88.2%)	34 (9.5%)
Duodenal ulcer	13 (44.8%)	16 (55.2%)	29 (8.1%)
Chronic atrophic gastritis	7 (33.3%)	14 (66.7%)	21 (5.9%)
Chronic duodenitis	3 (16.7%)	15 (83.3%)	18 (5.0%)
Chronic esophagitis	1 (7.1%)	13 (92.9%)	14 (3.9%)
Intestinal metaplasia	5 (50.0%)	5 (50.0%)	10 (2.8%)
Adenocarcinoma	2 (33.3%)	4 (66.7%)	6 (1.7%)
Squamous cell carcinoma	0 (0.0%)	2 (100%)	2 (0.6%)
Total	146 (40.8%)	212 (59.2%)	358 (100%)

When stratified by histological diagnosis (Table 3), *H. pylori* infection was most strongly associated with chronic active gastritis (90.4%), underscoring the known pathogenic link. Substantially lower positivity rates were noted in intestinal metaplasia (50%), adenocarcinoma (33.3%), and chronic esophagitis (7.1%), while no *H. pylori* was detected in cases of squamous cell carcinoma.

DOI: 10.3126/jpn.v15i2.89907

Table 4: Comparison of endoscopic and histopathological diagnosis based on site (Esophagus)

Endoscopic findings	Histopathological diagnosis			Total	p-value
	Chronic esophagitis	Reflux-associated epithelial changes	Squamous cell carcinoma		
Erosive esophagitis	14 (29.2%)	34 (70.8%)	0 (0%)	48 (96%)	0.001*
Suspicious/ Proliferative mass	0 (0%)	0 (0%)	2 (100%)	2 (4%)	
Total	14 (28%)	34 (68%)	2 (4%)	50 (100%)	

Endoscopic and histopathological correlation showed meaningful concordance across all anatomical sites. In the esophagus, erosive esophagitis was histologically confirmed as reflux-associated epithelial changes in 70.8% of cases, while both instances of squamous cell carcinoma corresponded precisely to endoscopic suspicion of proliferative lesions (Table 4, p = 0.001).

Table 5: Comparison of endoscopic findings and histopathologicaldiagnosis based on site (Stomach)

Endoscopic findings	Histopathological diagnosis						Total	p-value
	Adeno-carcinoma	Chronic active gastritis	Chronic atrophic gastritis	Chronic inactive gastritis	Gastric ulcer	Intestinal metaplasia		
Nodular gastritis	0 (0%)	52 (28.9%)	0 (0%)	118 (65.6%)	0 (0%)	10 (5.6%)	180 (69%)	0.001
Gastric ulcer	0 (0%)	0 (0%)	0 (0%)	0 (0%)	54 (100%)	0 (0%)	54 20.7%)	
Non-specific mucosal changes	0 (0%)	0 (0%)	21 (100%)	0 (0%)	0 (0%)	0 (0%)	21 (8.0%)	
Suspicious/ proliferative mass	6 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	6 (2.3%)	
Total	6 (2.3%)	52 (19.9%)	21 (8.0%)	118 (45.2%)	54 (20.7%)	10 (3.8%)	261 (100%)	

In the stomach, all cases endoscopically diagnosed as gastric ulcer were histologically confirmed. Nodular gastritis, which represented the majority of stomach biopsy findings, most commonly corresponded to chronic inactive gastritis (65.6%) and chronic active gastritis (28.9%) (p = 0.001). Intestinal metaplasia was uncommon in this group, accounting for only 5.6% of cases (Table 5).

Table 6: Comparison of endoscopic findings and histopathological diagnosis based on site (Duodenum)

Endoscopic findings	Histopathological diagnosis		Total	p-value
	Chronic duodenitis	Duodenal ulcer		
Duodenal ulcer	0 (0.0%)	29 (100%)	29 (61.7%)	0.001*
Erythematous duodenitis	18 (100%)	0 (0.0%)	18 (38.3%)	
Total	18 (38.3%)	29 (61.7%)	47 (100.0%)	

Analysis of duodenal biopsies showed complete concordance: all endoscopically suspected duodenal ulcers were histologically verified, while erythematous duodenitis consistently corresponded to chronic duodenitis (p = 0.001) (Table 6).

DISCUSSION

The demographic profile of our cohort, with a mean age of 44.9 years and a peak in the fourth decade, is comparable to Nepalese findings where mid-adult patients constitute the majority of dyspeptic and biopsy-proven upper gastrointestinal cases. KC et al. reported a mean age of 41.7 years in Kathmandu, and Rayamajhi et al. observed a similar mean of 45.7 years in a multi-centre study.[9,10] Koirala et al. likewise noted that most lesions occurred between 41-60 years.[11] Although our cohort had more male patients, several Nepalese studies found a slight female predominance, suggesting local differences in referral patterns and health-seeking behaviour. By contrast, European multi-centre data indicate a higher mean age at presentation, reflecting demographic and epidemiologic variation between regions.[12,13]

Gastric mucosal abnormalities were the predominant endoscopic findings in our study, consistent with South Asian evidence. Rayamajhi *et al.* reported gastritis in over 90% of dyspeptic patients, and KC et al. similarly identified antral gastritis as the most common lesion.[9,14] Indian studies, including those by Rauta and colleagues, also show gastritis and peptic ulceration as leading endoscopic diagnoses.[15] In contrast, Western series report substantially lower rates of gastritis and ulcer disease, a difference attributed to declining *H. pylori* prevalence and greater use of acid-suppressive therapy.[12,13]

Histopathology in our cohort was dominated by chronic inactive and chronic active gastritis, similar to the findings of KC et al. and Koirala et al., who also reported chronic active gastritis as the most common non-neoplastic lesion

in Nepalese biopsies.[9,11] Rayamajhi et al. observed higher rates of atrophy at 28.3% and intestinal metaplasia at 8.5%, differences that may reflect variation in biopsy sampling, age distribution and prior acid-suppressive therapy.[14] Comparable international evidence shows chronic gastritis to remain common, with Zuzek R et al. reporting histological gastritis in about 40.2% of asymptomatic Western adults.[16] A recent global meta-analysis by Soroorikia Set al. found intestinal metaplasia in roughly 17.5% of patients, highlighting regional variation in mucosal response shaped by infection burden and host factors.[17]

The *H. pylori* prevalence in our cohort was 40.8%, which is close to the South Asian pooled prevalence of 56.5% reported by Kharel *et al.* in their regional meta-analysis.[18] Infection in our series was most common in active gastritis and peptic ulcer, mirroring the associations described by KC et al. and Rayamajhi et al. in Nepalese cohorts.[9,10] International studies show a broad variation in *H. pylori* prevalence, with rates exceeding 50% in East Asia, including 55.8% in China, 54.0% in Korea and 51.7% in Japan.[19]

Endoscopy and histology showed strong agreement in our study, and all lesions suspected to be malignant on endoscopy were confirmed on biopsy. This is similar to the results of Koirala et al., who also reported complete concordance for neoplastic lesions, and to findings by Rauta et al.[9], who noted more than 90 percent accuracy for malignant and ulcer-related disease in India.[11,15] Overall, our results match regional and international patterns where most patients present in mid-adulthood, inflammatory gastric disease is common, and *H. pylori* is strongly linked to ulceration, as shown by KC et al., Rayamajhi et al., and Hooi et al.[9,11,19]

CONCLUSIONS

This study shows that most dyspeptic patients have benign inflammatory gastric pathology, with *H. pylori* contributing substantially to active gastritis and ulcer disease. The strong agreement between endoscopic impressions and histology for ulcerative and malignant lesions highlights the value of routine biopsy in ensuring accurate diagnosis and guiding effective management.

LIMITATIONS

This study was limited by its single-centre design and modest sample size, which may restrict generalizability. Targeted rather than systematic biopsies may have missed subtle lesions, and the lack of advanced endoscopic imaging techniques may have reduced sensitivity for early mucosal changes.

RECOMMENDATIONS

Future multi-center studies with standardized biopsy protocols are recommended. Routine biopsy should be encouraged to enhance diagnostic accuracy. Broader implementation of advanced imaging and strengthening of *H. pylori* testing and eradication strategies may reduce disease burden.

Acknowledgements

The authors acknowledge the Department of Gastroenterology, Nobel Medical College, for their support.

Conflict of interest: None

REFERENCES

1. Ford AC, Marwaha A, Sood R, Moayyedi P. Global prevalence of, and risk factors for, uninvestigated dyspepsia: a meta-analysis. Gut. 2015 Jul 1;64(7):1049-57. https://doi.org/10.1136/gutjnl-2014-307843
2. Talley NJ, Ford AC. Functional Dyspepsia. Longo DL, editor. N Engl J Med. 2015 Nov 5;373(19):1853-63. https://doi.org/10.1056/NEJMra1501505
3. Shaukat A, Wang A, Acosta RD, Bruining DH, Chandrasekhara V, Chathadi K V., et al. The role of endoscopy in dyspepsia. Gastrointest Endosc. 2015;82(2):227-32. https://doi.org/10.1016/j.gie.2015.04.003
4. Dixon MF, Genta RM, Yardley JH, Correa P, Batts KP, Dahms BB, et al. Classification and grading of gastritis. The updated Sydney System. International Workshop on the Histopathology of Gastritis, Houston 1994. Am J Surg Pathol. 1996;20(10):1161-81. https://doi.org/10.1097/00000478-199610000-00001
5. Malfertheiner P, Megraud F, O'Morain C, Gisbert JP, Kuipers EJ, Axon A, et al. Management of Helicobacter pylori infection-the Maastricht V/Florence Consensus Report. Gut. 2017 Jan 1;66(1):6-30. https://doi.org/10.1136/gutjnl-2016-312288
6. Polk DB, Peek RM. Helicobacter pylori: gastric cancer and beyond. Nat Rev Cancer 2010 106. 2010 Jun;10(6):403-14. https://doi.org/10.1038/nrc2857
7. Singh V, Trikha B, Nain CK, Singh K, Vaiphei K. Epidemiology of Helicobacter pylori and peptic ulcer in India. J Gastroenterol Hepatol. 2002 Jun 1;17(6):659-65. https://doi.org/10.1046/j.1440-1746.2002.02746.x
8. Correa P, Piazuelo MB. Natural history of Helicobacter pylori infection. Dig Liver Dis. 2008 Jul 1;40(7):490-6. https://doi.org/10.1016/j.dld.2008.02.035
9. Rauta S, Baisakh P, Sahoo AK, Panda DK, Baisakh MR, Dash S s. Correlation of Endoscopic and Histopathological Diagnoses in Upper Gastrointestinal Tract Lesions: A Cross-Sectional Study. Cureus. 2024;16(9). https://doi.org/10.7759/cureus.69553
10. Khadka P, Thapa R, Shrestha M, Kc SR. Histopathological Evaluation of Gastric Biopsies and its Association with Endoscopic Findings. 2025;7:693-8. https://doi.org/10.3126/nmj.v7i1.85221
11. Rayamajhi P, Nepal G, Ojha R, Rajbhandari R, Gajurel BP, Karn R. Evaluating cognitive outcomes in adult patients with acute encephalitis syndrome: a prospective study from a tertiary care center in Nepal. Enceph (Seoul, Korea). 2022 Apr 10;2(2):36-44. https://doi.org/10.47936/encephalitis.2021.00157
12. Koirala S, Khadka A, Bhusal S, Shrestha R, Prasai A. Histopathological Spectrum of the Upper Gastrointestinal Tract Endoscopic Biopsies at a Tertiary Hospital: A Descriptive Cross-sectional Study. J Nepal Med Assoc. 2024 Jun 30;62(275):453-7. https://doi.org/10.31729/jnma.8676

13. De Francesco V, Zullo A, Amato A, Bergna I, Bendia E, Giorgini G, et al. Prevalence of Endoscopic and Histological Lesions at Upper Endoscopy: A Cross-Sectional, Multicentre Study in Clinical Practice. GE - Port J Gastroenterol. 2025 Feb 3;32(1):1-8. https://doi.org/10.1159/000537685

14. Lanas A, Chan FKL. Peptic ulcer disease. Lancet. 2017 Aug 5;390(10094):613-24. https://doi.org/10.1016/S0140-6736(16)32404-7

15. Rayamajhi A. Endoscopic findings and prevalence of Helicobacter pylori among dyspeptic patients in Nepal : A cross- sectional study. 2025;1-19. https://doi.org/10.21203/rs.3.rs-7311683/v1

16. Zuzek R, Potter M, Talley NJ, Agréus L, Andreasson A, Veits L, et al. Prevalence of Histological Gastritis in a Community Population and Association with Epigastric Pain. Dig Dis Sci 2023 692. 2023 Dec 13;69(2):528-37. https://doi.org/10.1007/s10620-023-08170-2

17. Soroorikia S, Kazeminia M, Qaderi K, Ziapour A, Hodhodi T, Javanbakht Z. Global prevalence of gastric intestinal metaplasia: a systematic review and meta-analysis. Syst Rev. 2024 Dec 1;13(1):247. https://doi.org/10.1186/s13643-024-02633-x

18. Kharel S, Bist A, Shrestha S, Homagain S. Helicobacter pylori healthy South Asians. JGH Open. 2020;4(6):1037-46. https://doi.org/10.1002/jgh3.12426

19. 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):420-9. https://doi.org/10.1053/j.gastro.2017.04.022