

Helicobacter pylori Prevalence Found by Rapid Urease Test in Dyspeptic Patients Having Upper GI Endoscopy at an Eastern Bihar Tertiary Care Facility

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Received: 27-07-2025 / Revised: 25-08-2025 / Accepted: 27-09-2025

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Conflict of interest: Nil

Abstract:

Background: Dyspepsia is a frequent gastrointestinal complaint, with *Helicobacter pylori* recognized as a key contributing factor. Rapid Urease Test (RUT) is a simple, cost-effective diagnostic tool performed during endoscopy.

Aim: To find out how common *H. pylori* is in Southern Bihar among dyspepsia patients having upper gastrointestinal endoscopies.

Methods: This prospective study was carried out at Katihar Medical College Hospital over one year (April 2023–March 2024). A total of 500 consecutive dyspeptic patients were enrolled. Antral biopsies were collected during endoscopy and examined with RUT. Demographic data, risk factors, and endoscopic findings were recorded.

Results: Of 500 participants, 278 (55.6%) were RUT positive. Men had higher prevalence (62.9%) compared with women (37.1%). Maximum positivity was observed in the 31–50 year age group (61.2%). Correlation with endoscopic findings revealed positivity in 70.4% of duodenal ulcers, 64.7% of gastric ulcers, 58.1% of gastritis, and 38.2% of cases with normal mucosa. Smoking, alcohol consumption, and low socioeconomic status showed significant association with infection ($p < 0.05$).

Conclusion: More than half of dyspeptic patients in Eastern Bihar were infected with *H. pylori*. RUT proved reliable and practical. Strong association with ulcerative lesions and modifiable lifestyle factors highlights the importance of early detection and eradication therapy.

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Introduction

Dyspepsia remains one of the most common upper gastrointestinal disorders encountered in practice, characterized by epigastric discomfort, bloating, nausea, and early satiety. Among its various causes, *Helicobacter pylori* has been firmly established as a major contributor. Mucosa-associated lymphoid tissue (MALT) lymphoma, gastric cancer, peptic ulcer disease, and chronic gastritis are all linked to this gram-negative bacterium that colonizes the gastric mucosa. Globally, over half the population harbors the infection, with prevalence rates particularly high in developing nations due to poor hygiene, overcrowding, and unsafe food and water.

In India, *H. pylori* prevalence has been reported between 50% and 80%. Risk factors such as smoking, alcohol use, malnutrition, and low socioeconomic status further facilitate persistence of infection and progression of mucosal injury. Despite its widespread burden, many infections remain

undiagnosed, and patients often present late with complications. This makes timely diagnosis crucial, especially in states like Bihar where healthcare access is limited.

Although several diagnostic options exist—such as histology, culture, stool antigen test, urea breath test, and molecular assays—most are costly or resource-intensive. The Rapid Urease Test (RUT), however, is quick, affordable, and widely used during endoscopy. It detects urease enzyme activity of *H. pylori*, producing a visible color change. Given the high prevalence of dyspepsia in this region, the present study was undertaken to evaluate *H. pylori* prevalence by RUT and to analyze its correlation with demographic, lifestyle, and endoscopic features.

Materials and Methods

- **Design:** Prospective observational study.

- **Duration:** April 2023–March 2024.
- **Setting:** Katihar Medical College Hospital, Katihar, Bihar.
- **Sample size:** 500 consecutive dyspeptic patients.

Inclusion criteria:

- Age ≥ 18 years.
- Patients undergoing endoscopy for dyspepsia with consent.

Exclusion criteria:

- Prior gastric surgery.
- Recent use of proton pump inhibitors, antibiotics, or bismuth compounds (within 4 weeks).
- Refusal to undergo biopsy.

Procedure:

All patients underwent endoscopy with two antral

biopsies. Samples were placed in RUT medium and observed for color change within 1–24 hours. A shift from yellow to red indicated positivity.

Analysis:

Data were entered into Microsoft Excel and analyzed with SPSS v21. Chi-square test was used for associations, with $p < 0.05$ considered significant.

Results

- **Demographics:** Mean age 39.6 ± 12.4 years. Males 62.4%, females 37.6%.
- **Prevalence:** RUT positive in 278 (55.6%) cases.
- **Age trends:** Highest prevalence in 31–50 years (61.2%).
- **Risk factors:** Infection more common among smokers (67.1%), alcohol users (64.5%), and low socioeconomic groups (60.9%). Associations significant ($p < 0.05$).

Table 1: Endoscopic findings

Endoscopic finding	Total cases	H. pylori positive (%)
Duodenal ulcer	108	70.4
Gastric ulcer	68	64.7
Gastritis	215	58.1
Normal mucosa	109	38.2

Discussion

Our study documented a prevalence of 55.6% for H. pylori among dyspeptic patients in Eastern Bihar, consistent with reports from other Indian regions. The slightly lower rate compared to older data may reflect improvements in sanitation and increased awareness of eradication therapy.

Men were more commonly infected, possibly due to higher exposure to smoking and alcohol. The peak prevalence in the 31–50 year group highlights the burden of infection in the most economically active segment of the population.

Endoscopic correlation reaffirmed the strong link between H. pylori and ulcer disease, particularly duodenal ulcers. The detection of infection in nearly 40% of patients with normal mucosa indicates latent or subclinical infection, reinforcing the importance of screening beyond visible lesions.

Risk factors such as smoking, alcohol, and low socioeconomic status were significantly associated, consistent with the role of environmental and lifestyle contributors. Preventive strategies must address sanitation, hygiene, and health education alongside medical therapy.

RUT proved to be a practical diagnostic tool. While advanced techniques exist, their feasibility in resource-limited regions is low. RUT provides rapid results and allows immediate clinical decision-

making, making it suitable for routine practice in tertiary hospitals like ours.

Persistent infection is a risk factor for severe complications, including gastric carcinoma and MALT lymphoma. With more than half of dyspeptic patients testing positive in this study, a strong case exists for routine testing during endoscopy and timely eradication therapy to reduce future disease burden.

Conclusion

In this prospective study of 500 dyspeptic patients, H. pylori prevalence by RUT was 55.6%. Infection was more common in males, middle-aged adults, smokers, alcohol users, and low socioeconomic groups. Strong associations with peptic ulcer disease reaffirm the role of the bacterium in gastrointestinal pathology. RUT proved to be a rapid, reliable, and cost-effective diagnostic method. Routine use and early eradication therapy are recommended to prevent complications in high-burden areas such as Eastern Bihar.

References

1. Malfertheiner P, Megraud F, Rokkas T, et al. Management of Helicobacter pylori infection—the Maastricht VI/Florence consensus report. Gut. 2022;71(9):1724-62.

2. Graham DY, Fischbach L. Helicobacter pylori treatment in the era of increasing antibiotic resistance. *Gut*. 2010;59(8):1143-53.
3. Ford AC, Forman D, Hunt RH, Yuan Y, Moayyedi P. Helicobacter pylori eradication therapy to prevent gastric cancer in healthy asymptomatic infected individuals: systematic review and meta-analysis. *BMJ*. 2014;348:g3174.
4. Singh V, Trikha B, Nain CK, Singh K, Vaiphei K. Epidemiology of Helicobacter pylori and peptic ulcer in India. *J Gastroenterol Hepatol*. 2002; 17(6):659-65.
5. Goel A, Tandon RK. Prevalence of Helicobacter pylori infection in Indian patients with dyspepsia. *Indian J Gastroenterol*. 1999; 18(2): 22-5.
6. Misra V, Misra SP, Dwivedi M, Singh PA, Gupta SC. Prevalence of H. pylori in healthy population of India: a serological study. *Indian J Gastroenterol*. 1998;17(4):113-5.
7. Bhat N, Sood A, Sharma B, et al. Seroprevalence of H. pylori infection and risk factors in Himachal Pradesh. *Indian J Med Microbiol*. 2018;36(3):357-61.
8. Sathar SA, Khamar M, Sulaiman C, et al. Role of rapid urease test in diagnosis of H. pylori infection. *Trop Gastroenterol*. 2014;35(3):162-5.
9. Choudhury A, Choudhury N, Dey A, et al. Prevalence of Helicobacter pylori in dyspeptic patients of Assam and its association with gastric lesions. *Indian J Pathol Microbiol*. 2016;59(3):308-12.
10. Kibria MG, Islam MS, Rahman MM, et al. Prevalence of H. pylori among dyspeptic patients in Bangladesh. *Mymensingh Med J*. 2017; 26(1):33-9.
11. Park JY, Forman D, Waskito LA, Yamaoka Y, Crabtree JE. Epidemiology of Helicobacter pylori and CagA-positive infections and global variations in gastric cancer. *Toxins*. 2018; 10(4):163.
12. Fock KM, Ang TL. Epidemiology of H. pylori infection and gastric cancer in Asia. *J Gastroenterol Hepatol*. 2010;25(3):479-86.
13. Brown LM. Helicobacter pylori: epidemiology and routes of transmission. *Epidemiol Rev*. 2000; 22(2):283-97.
14. Kusters JG, van Vliet AH, Kuipers EJ. Pathogenesis of Helicobacter pylori infection. *Clin Microbiol Rev*. 2006;19(3):449-90.
15. Malfertheiner P, Chan FK, McColl KE. Peptic ulcer disease. *Lancet*. 2009;374(9699):1449-61.
16. Patel SK, Pratap CB, Jain AK, Gulati AK, Nath G. Diagnosis of Helicobacter pylori: what should be the gold standard? *World J Gastroenterol*. 2014;20(36):12847-59.
17. Thirumurthi S, Graham DY. Helicobacter pylori infection in India from a western perspective. *Indian J Med Res*. 2012;136(4):549-62.
18. Nijevitch AA, Shcherbakov PL, Mayanskiy NA, et al. Diagnostic accuracy of invasive and non-invasive methods for H. pylori infection in children. *Pediatr Int*. 2017;59(5):594-9.
19. Logan RP, Walker MM. Epidemiology and diagnosis of Helicobacter pylori. *BMJ*. 2001;323(7318):920-2.
20. Hooi JKY, Lai WY, Ng WK, et al. Global prevalence of Helicobacter pylori infection: systematic review and meta-analysis. *Gastroenterology*. 2017;153(2):420-9.