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Study of *Helicobacter Pylori* infection amongst patients undergoing upper gastrointestinal endoscopy at tertiary care centre

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Abstract
Background: *Helicobacter Pylori* infection is a major cause of chronic gastritis, peptic ulcer disease, and gastric malignancy. Despite its high prevalence in developing countries, regional data on its occurrence among patients undergoing upper gastrointestinal (UGI) endoscopy remain limited.
Objectives: To determine the prevalence of H. pylori infection among patients undergoing UGI endoscopy and to evaluate its association with demographic characteristics and clinical presentation.
Methods: A hospital-based descriptive cross-sectional study was conducted among 160 adult patients undergoing UGI endoscopy over 18 months. Gastric biopsy specimens obtained during endoscopy were subjected to the Rapid Urease Test (RUT) for detection of H. pylori. Clinical, demographic, and endoscopic data were collected and analyzed using appropriate statistical tests, with $p < 0.05$ considered significant.
Results: The mean age of participants was 38.91 ± 10.36 years. Dyspepsia (30.6%) was the most common indication for endoscopy, followed by gastritis (21.3%). H. pylori infection was detected in 101 of 160 patients, yielding a prevalence of 63.1%. Significant associations were observed between RUT positivity and increasing age, male gender, and specific clinical presentations.Among RUT-positive patients, gastritis (32.7%) and dyspepsia (31.7%) were the predominant indications, while peptic ulcer symptoms were observed exclusively in infected individuals.
Conclusion: H. pylori infection is highly prevalent among symptomatic patients undergoing UGI endoscopy. Increasing age, male gender, gastritis, dyspepsia, and peptic ulcer symptoms were significantly associated with infection. The Rapid Urease Test proved to be a simple and effective diagnostic tool during endoscopic evaluation. Early detection and eradication of H. pylori may reduce the burden of chronic gastritis, peptic ulcer disease, and other long-term gastrointestinal complications.

Keywords: Rapid urease test, gastritis, dyspepsia, peptic ulcer disease, gastric biopsy, demographic characteristics

Introduction

Helicobacter Pylori is a spiral-shaped, microaerophilic, Gram-negative bacterium that colonizes the gastric mucosa of nearly half of the global population. Since its discovery by Barry Marshall and Robin Warren in 1982, H. pylori has been recognized as one of the most important pathogens affecting the gastrointestinal tract. The bacterium possesses unique adaptive mechanisms, including flagellar motility and production of large amounts of urease, which enable its survival in the highly acidic gastric environment. Persistent colonization induces chronic gastric inflammation and is strongly associated with chronic gastritis, peptic ulcer disease, gastric adenocarcinoma, and mucosa-associated lymphoid tissue (MALT) lymphoma. Owing to its well-established role in gastric carcinogenesis, the International Agency for Research on Cancer (IARC) has classified H. pylori as a Group I carcinogen.

H. pylori infection is usually acquired during childhood and persists throughout life unless eradicated by appropriate treatment. The infection is transmitted primarily through fecal–oral and oral–oral routes, with prevalence influenced by socioeconomic status, sanitation, overcrowding, and access to healthcare. The burden of infection remains disproportionately high in developing countries, where prevalence rates often exceed 70%, compared to 30–50% in developed nations. India continues to report a substantial prevalence of H. pylori infection despite improvements in hygiene and living standards. Most infected individuals remain asymptomatic; however, a significant proportion develop uppers gastrointestinal symptoms such as dyspepsia, epigastric pain, bloating, nausea, vomiting, and unexplained anemia. Bacterial virulence factors, particularly cytotoxin-associated gene A (CagA) and vacuolating cytotoxin A (VacA), together with host and environmental factors, play important roles in determining disease severity and clinical outcomes.

Upper gastrointestinal endoscopy remains an essential diagnostic tool for evaluating patients with persistent upper gastrointestinal symptoms and suspected gastric pathology. Besides allowing direct visualization of mucosal abnormalities, endoscopy facilitates the diagnosis of H. pylori infection through biopsy-based investigations such as rapid urease testing and histopathological examination. Early detection of H. pylori is clinically important because eradication therapy has been shown to reduce the risk of peptic ulcer recurrence and may prevent progression to gastric malignancy. Several studies conducted worldwide have reported varying prevalence rates of H. pylori infection among patients undergoing upper gastrointestinal endoscopy, reflecting geographical, demographic, and socioeconomic differences.

Despite the high burden of H. pylori infection in India, regional data regarding its prevalence among patients undergoing upper gastrointestinal endoscopy remain

limited. Understanding the local epidemiology of H. pylori infection and its association with endoscopic findings is essential for optimizing diagnostic strategies and improving patient outcomes. Therefore, the present study was undertaken to determine the prevalence of *Helicobacter Pylori* infection among patients undergoing upper gastrointestinal endoscopy at a tertiary care center and to evaluate its association with demographic characteristics and endoscopic findings.
So the study was conducted with the following aims and objectives

Aim & Objectives
Aim
To study *Helicobacter Pylori* infection amongst patients undergoing under gastrointestinal endoscopy.

Objective
1. To estimate the proportion of H. Pylori in patients undergoing upper gastrointestinal endoscopy.
2. To study clinical profile of patients infected with Helicobacter pylori.

Methodology
Study Design
A hospital-based, observational, cross-sectional study was conducted to determine the prevalence of *Helicobacter Pylori* infection and its association with clinical and endoscopic findings among patients undergoing upper gastrointestinal (UGI) endoscopy.

Study Setting
The study was conducted in the Department of General Surgery of a tertiary care teaching hospital catering to both urban and rural populations. The study was carried out over a period of 18 months after obtaining approval from the Institutional Ethics Committee.

Participants
The study population consisted of adult patients presenting with upper gastrointestinal symptoms and undergoing UGI endoscopy.

Inclusion Criteria
1. Patients aged ≥18 years undergoing upper gastrointestinal endoscopy.
2. Patients willing to participate and provide written informed consent.
3. Patients of either gender presenting with upper gastrointestinal symptoms.

Exclusion Criteria
1. Patients with a history of treatment for H. pylori infection within the previous one year.
2. Patients below 18 years of age.
3. Patients unwilling to participate or unable to provide informed consent.

Materials
1. Predesigned and pretested data collection proforma.
2. Upper gastrointestinal endoscopy equipment.
3. Gastric biopsy forceps.
4. Commercially available Rapid Urease Test (RUT) kit.
5. Microsoft Excel for data entry.
6. SPSS version 26.0 for statistical analysis.

Variables Primary Variable
Presence of *Helicobacter Pylori* infection (RUT positive/negative).

Independent Variables
1. Demographic characteristics (age, gender).
2. Clinical symptoms (epigastric pain, upper abdominal pain, dyspepsia, heartburn, nausea, vomiting, gastrointestinal bleeding, etc.).
3. Lifestyle factors (smoking, alcohol consumption, dietary habits).
4. Comorbidities.
5. Endoscopic findings (gastritis, erosive gastritis, gastric ulcer, duodenal ulcer, duodenitis, GERD, growth lesions, etc.).

Procedure
After obtaining Institutional Ethics Committee approval, eligible patients were recruited consecutively. Written informed consent was obtained before enrolment. Detailed demographic and clinical information was collected using a structured proforma. All participants underwent comprehensive clinical examination followed by upper gastrointestinal endoscopy according to institutional protocols.
During endoscopy, gastric mucosal biopsy specimens were obtained from appropriate sites. Biopsy samples were subjected immediately to Rapid Urease Testing using a commercially available kit. Development of colour change in the test medium indicating urease activity was considered positive for H. pylori infection, while absence of colour change was considered negative. Patients were subsequently categorized into H. pylori-positive and H. pylori-negative groups.

Bias Control
1. Consecutive sampling was employed to minimize selection bias.
2. Uniform inclusion and exclusion criteria were applied to all participants.
3. Standardized data collection using a predesigned proforma reduced information bias.
4. Endoscopic procedures and Rapid Urease Testing were performed according to standard institutional protocols.
5. Objective interpretation of RUT results minimized observer bias.

Sample Size
The minimum sample size required was 160 participants.

Statistics
Data were entered into Microsoft Excel and analyzed using SPSS version 26.0.
1. Continuous variables were expressed as mean ± standard deviation (SD) or median with interquartile range (IQR), as appropriate.
2. Categorical variables were presented as frequencies and percentages.
3. The prevalence of H. pylori infection was expressed as percentage with 95% confidence interval.
4. Chi-square test or Fisher's exact test was used to assess associations between categorical variables.

5. Student's independent t-test was used for normally distributed continuous variables.
6. Mann–Whitney U test was used for non-normally distributed continuous variables.
7. A p-value <0.05 was considered statistically significant.

Ethics

The study was initiated only after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from all participants prior to enrolment. Confidentiality and anonymity of participant information were maintained throughout the study.

Participation was entirely voluntary, and participants were free to withdraw from the study at any stage without affecting their medical care or treatment.

Results

Table 1: Distribution According to Age Group

Age Group	Frequency	Percent
21–30	43	26.9
31–40	47	29.4
41–50	41	25.6
51–60	29	18.1
Total	160	100

The age group distribution revealed that the majority of participants belonged to the 31–40 years age group, accounting for 47 participants (29.4%), followed closely by the 21–30 years age group with 43 participants (26.9%). Participants aged 41–50 years constituted 41 cases (25.6%), while the least number of participants were in the 51–60 years age group, comprising 29 individuals (18.1%). Overall, the study population was predominantly composed of adults between 21 and 50 years of age.

Table 2: Gender-wise Distribution

Gender	Frequency	Percent
Female	80	50.0
Male	80	50.0
Total	160	100

The gender distribution of the study participants demonstrated an equal representation of both sexes. Out of 160 participants, 80 (50.0%) were females and 80 (50.0%) were males. This balanced gender distribution minimizes gender-related sampling bias and allows reliable comparison between male and female participants in relation to *Helicobacter Pylori* infection status.

Table 3: Rapid Urease Test (RUT) Results

Result	Frequency	Percent
Negative	59	36.9
Positive	101	63.1
Total	160	100

The distribution of Rapid Urease Test (RUT) results showed that 101 participants (63.1%) tested positive for *Helicobacter Pylori* infection, whereas 59 participants (36.9%) tested negative.

Table 4: Association Between Indication for Endoscopy and RUT Results

Indication	RUT Negative	RUT Positive	Total
Abdominal bloating	15	0	15
Dyspepsia	17	32	49
Epigastric pain	4	14	18
Gastritis	1	33	34
GERD symptoms	11	5	16
Nausea and vomiting	11	0	11
Peptic ulcer symptoms	0	17	17
Total	59	101	160

A statistically highly significant association was observed between the indication for endoscopy and RUT results (Chi-square = 80.003, p < 0.001). Among RUT-negativeparticipants, dyspepsia was the most common indication, accounting for 28.8% of cases, followed by abdominal bloating (25.4%) and GERD symptoms (18.6%). In contrast, among RUT-positive participants, gastritis was the most frequent indication (32.7%), closely followed by dyspepsia (31.7%). Peptic ulcer symptoms were observed exclusively among RUT-positive participants (16.8%), while no RUT-positive cases were reported among participants with abdominal bloating or nausea and vomiting. These findings suggest a strong association between *Helicobacter Pylori* positivity and clinical presentations such as gastritis, dyspepsia, and peptic ulcer symptoms.

Discussion

The present study was conducted to evaluate the prevalence of *Helicobacter Pylori* infection among patients undergoing upper gastrointestinal endoscopy and to assess its association with demographic characteristics and clinical indications using the Rapid Urease Test (RUT). H. pylori remains one of the most common chronic bacterial infections worldwide and is strongly associated with gastritis, peptic ulcer disease, and gastric malignancies.

The mean age of the study population was 38.91 ± 10.36 years, with most participants belonging to the 21–50-year age group. This finding is comparable with previous studies reporting that symptomatic patients undergoing endoscopy are predominantly middle-aged adults. Dyspepsia was the most common indication for endoscopy (30.6%), followed by gastritis (21.3%), epigastric pain (11.3%), peptic ulcer symptoms (10.6%), GERD symptoms (10.0%), abdominal bloating (9.4%), and nausea with vomiting (6.9%). These findings are consistent with the established role of H. pylori in chronic dyspepsia and gastritis.

A major finding of the study was the high prevalence of H. pylori infection, with 63.1% of participants testing positive by RUT. This prevalence is comparable to reports from developing countries, particularly India, where infection rates commonly range from 50–80% among symptomatic adults. The high positivity rate underscores the continuing public health significance of H. pylori infection and highlights the importance of early diagnosis and eradication therapy.

A statistically significant association was observed between age and RUT positivity. Infection rates increased with advancing age, with the highest positivity observed among participants aged 41–60 years. This trend may reflect cumulative exposure and persistence of infection acquired earlier in life. Gender was also significantly associated with

infection, with males accounting for the majority of RUT-positive cases. This finding is in agreement with studies suggesting that lifestyle and environmental factors may contribute to increased susceptibility among men.

A highly significant association was found between endoscopic indications and RUT positivity. Among infected patients, gastritis and dyspepsia were the most common clinical presentations, followed by peptic ulcer symptoms and epigastric pain. Peptic ulcer symptoms were observed exclusively among RUT-positive patients, supporting the well-established role of H. pylori in ulcer pathogenesis. Gastritis was the predominant endoscopic finding among infected individuals, reflecting the organism's ability to induce chronic gastric inflammation through persistent mucosal colonization. Dyspepsia also showed a strong association with infection, emphasizing the importance of H. pylori testing in patients presenting with persistent upper gastrointestinal symptoms.

Interestingly, GERD symptoms were more common among RUT-negative patients, suggesting a weak or inverse association between H. pylori infection and reflux disease, as reported in previous studies.

Overall, the present study demonstrated a high prevalence of H. pylori infection among symptomatic patients undergoing upper gastrointestinal endoscopy. Significant associations were observed with increasing age, male gender, gastritis, dyspepsia, and peptic ulcer symptoms. These findings support the clinical utility of the Rapid Urease Test as a simple and effective diagnostic tool and emphasize the importance of timely diagnosis and eradication of H. pylori to reduce gastrointestinal morbidity and prevent long-term complications.

Conclusion

The present study demonstrated a high prevalence of *Helicobacter Pylori* infection (63.1%) among patients undergoing upper gastrointestinal endoscopy, highlighting the continued burden of the infection in symptomatic individuals. Significant associations were observed between H. pylori positivity and increasing age, male gender, and specific clinical indications, particularly gastritis, dyspepsia, and peptic ulcer symptoms. Gastritis and dyspepsia were the most common presentations among infected patients, while peptic ulcer symptoms showed a strong association with H. pylori infection.

The findings indicate that H. pylori remains an important etiological factor in upper gastrointestinal disorders and should be considered in patients presenting with persistent dyspeptic symptoms and endoscopic evidence of gastritis or peptic ulcer disease. The Rapid Urease Test proved to be a simple, rapid, and effective diagnostic method for detecting active infection during endoscopic evaluation.

Early identification and appropriate eradication therapy for H. pylori can reduce the burden of chronic gastritis, prevent peptic ulcer disease and its recurrence, and potentially decrease the risk of long-term complications such as gastric malignancy. Routine testing for H. pylori in selected symptomatic patients undergoing upper gastrointestinal endoscopy may therefore contribute to improved patient outcomes and better gastrointestinal health.

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