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Original Research Article

Study on Prevalance of Helicobacter Pylori Infection Detected By Rapid Urease Test in Patients Presenting with Dyspeptic Symptoms

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Conflict of interest: Nil

Abstract

Background: Helicobacter pylori (H. pylori) is a major cause of various gastrointestinal disorders, including gastritis, peptic ulcer disease, and gastric cancer. It is particularly prevalent in populations with poor sanitation and hygiene. Rapid and accurate diagnosis of H. pylori infection is crucial for effective treatment and prevention of complications.

Aim and Objectives: To determine the prevalence of H. pylori infection among dyspeptic patients using the Rapid Urease Test (RUT). To analyze the association between H. pylori infection and endoscopic as well as histopathological findings. To assess the impact of demographic and lifestyle factors on H. pylori infection.

Materials and Methods: A hospital-based observational study was conducted at Basaveshwara Medical College and Hospital, Chitradurga, from May 2023 to October 2024. A total of 50 patients with dyspeptic symptoms underwent upper gastrointestinal endoscopy. Biopsy specimens were collected and tested for H. pylori using the Rapid Urease Test and histopathological examination. Relevant clinical, demographic, and lifestyle data were recorded. Statistical analysis was performed using appropriate tests to assess correlations.

Results: The prevalence of H. pylori infection was 50% based on RUT and histopathological confirmation. Epigastric pain (86%) was the most common symptom. Gastritis (84%) was the predominant endoscopic finding, followed by GERD (54%) and gastric erosion (50%). There was a significant correlation between RUT and histopathology results ($p < 0.001$), confirming the diagnostic accuracy of RUT. No significant association was found between H. pylori infection and specific endoscopic findings ($p > 0.05$).

Conclusion: The study highlights a high prevalence of H. pylori infection (50%) among dyspeptic patients. Routine screening using RUT and histopathology can aid in early detection and treatment. Lifestyle factors such as smoking and alcohol consumption may contribute to disease progression. Further large-scale studies are recommended to explore non-H. pylori causes of dyspepsia and improve treatment strategies.

Keywords: Helicobacter pylori, Rapid Urease Test, Dyspepsia, Gastritis, Endoscopy.

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Introduction

In 1983, Brown et al. from Perth, Western Australia, identified Helicobacter pylori (H. pylori). Initially, it was classified as Campylobacter pylori due to its structural similarities with other Campylobacter species, including C. jejuni. H. pylori is a small, spiral-shaped, gram-negative rod measuring approximately 0.5-1.0 µm in width and 2.5-5.0 µm in length.

It is highly motile due to its 4-6 unipolar sheathed flagella. One of its most notable biochemical traits is the production of significant amounts of urease, which breaks down urea into carbon dioxide and ammonia, enabling H. pylori to neutralize gastric acid in its immediate surroundings. This bacterium colonizes the human stomach and is linked to gastritis, gastric and duodenal ulcers (DU), and has been implicated in the development of gastric carcinoma and mucosa-associated lymphoid tissue (MALT) lymphomas.

It is estimated that nearly half of the global population is infected with H. pylori, making it one of the most prevalent bacterial infections in

humans. Worldwide prevalence is approximately 50%, with rates as high as 80-90% in developing nations. Dyspepsia, characterized by upper abdominal discomfort, bloating, and nausea, is commonly linked to H. pylori infection, highlighting the importance of accurate diagnosis and management in clinical settings. Various diagnostic tests are available to detect H. pylori, categorized into invasive and non-invasive methods. The rapid urease test (RUT) is a widely used invasive diagnostic tool due to its high specificity. It identifies urease activity in gastric biopsy samples obtained through endoscopy, delivering results within minutes to hours.

Materials and Methods

Study Design and Location: This hospital-based cross-sectional study was conducted at Basaveshwara Medical College and Hospital, Chitradurga, Karnataka, India, over a period of 18 months, from May 2023 to October 2024.

Study Population: Participants included 50 male and female patients aged 18-60 years who presented with dyspeptic symptoms at the Department of General Surgery. Patients with gastric malignancy, chronic pancreatitis, those using PPIs or H2 receptor antagonists within the last six weeks, or NSAIDs for more than a week were excluded.

Procedure: Upper gastrointestinal (GI) endoscopy was performed using a flexible endoscope. Biopsy samples (2-3 mm) were taken from areas showing severe gastritis, ulcer edges, or randomly from the gastric antrum and body. Biopsy specimens were immediately placed in an RUT kit containing urea and pH indicators. A color change from yellow to pink due to increased pH confirmed H. pylori infection. Patients testing positive received a 14-day triple therapy regimen or appropriate eradication therapy.

Statistical Analysis: Data was collected in Microsoft Excel and analyzed using SPSS version 23. Associations between H. pylori prevalence and clinical variables were analyzed using chi-square tests and logistic regression. Statistical significance was considered at $p < 0.05$.

Results

A total of 50 patients presenting with dyspeptic symptoms were included in the study.

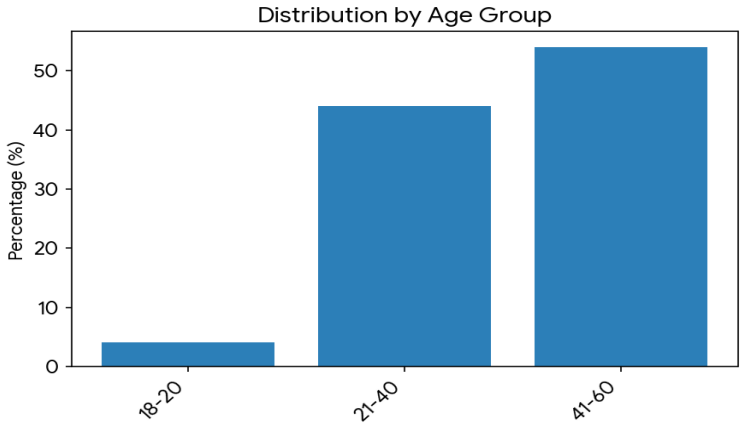

Figure 1: Distribution of patients according to age

A majority of patients (54%) were in the 41-60 years age group, followed by 44% in the 21-40 years range.

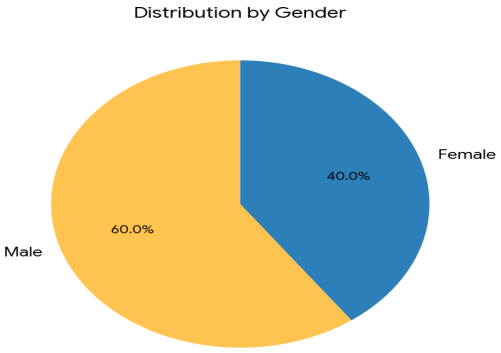

Table 2 & Figure 2: Distribution of patients according to gender

The gender breakdown reveals that 60% of patients were male and 40% female, indicating a male predominance.

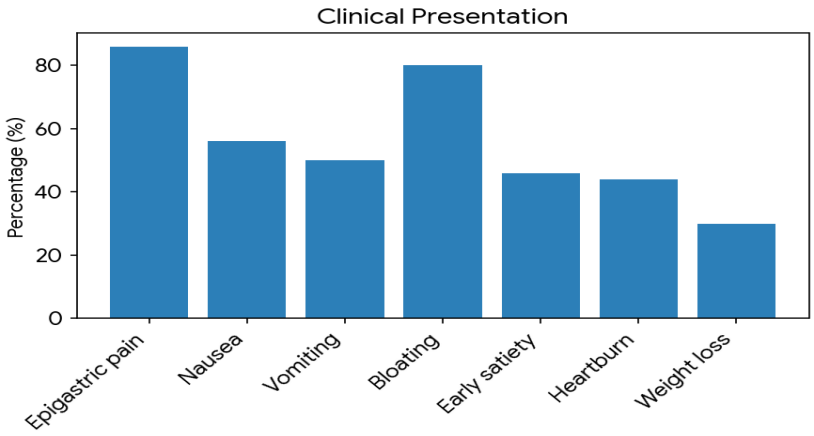

Figure 3: Clinical Presentation

Epigastric pain was the most common symptom (86%), followed closely by bloating (80%).

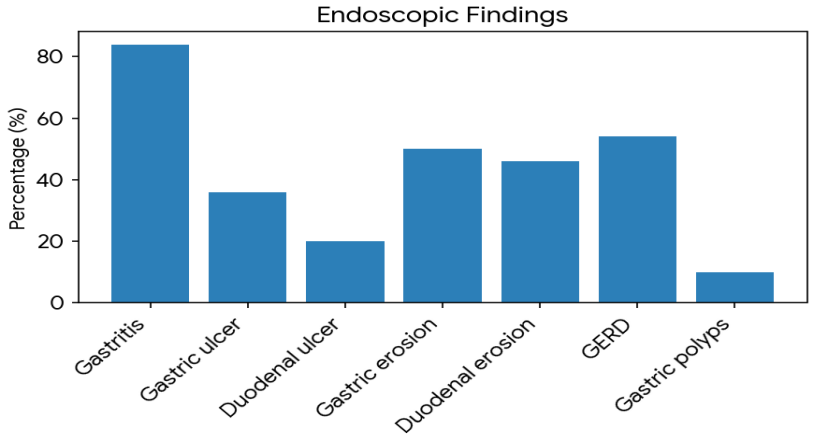

Figure 4: Endoscopic Findings

Gastritis was the most common finding (84%), followed by GERD (54%), and gastric erosion (50%).

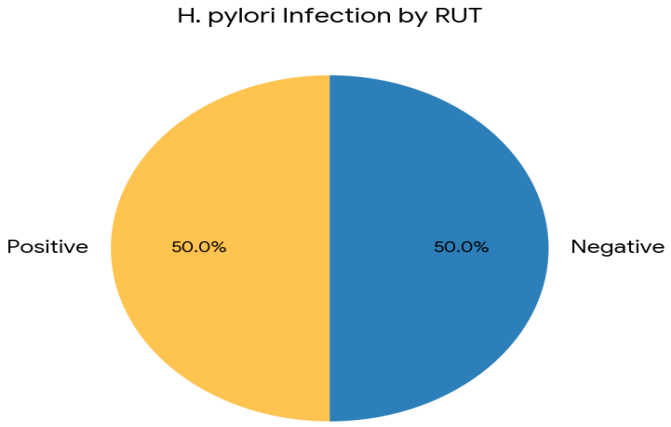

Figure 5: Prevalence of H. pylori Infection by Rapid Urease Test

The rapid urease test for H. pylori infection was positive in 50% of patients, indicating that H. pylori is a significant factor contributing to dyspeptic symptoms.

Association of H. pylori infection with histopathology report: There was a strong correlation between rapid urease test results and histopathology ($p < 0.001$). Among H. pylori-positive patients (by rapid urease test), 93.3% were also positive on histopathology, indicating the high diagnostic accuracy of the rapid urease test in detecting H. pylori.

Discussion

Helicobacter pylori infection is one of the most widespread chronic bacterial infections globally. Dyspepsia, which manifests as persistent or recurrent epigastric pain or discomfort, is one of the most frequently reported symptoms in gastroenterology clinics. The present study aimed to assess the prevalence of H. pylori infection using the Rapid Urease Test (RUT) in patients with dyspeptic symptoms. In this study, a majority of patients experiencing dyspeptic symptoms were within the 41-60 years age group (53.3%), with a male predominance (60%). Among the participants, epigastric pain was the most commonly reported symptom (86.7%), followed by bloating (80%). The predominance of epigastric pain aligns with the classic presentation of peptic ulcer disease. The prevalence of H. pylori infection using RUT was 50%, and histopathology confirmed H. pylori in 50% of cases. A strong concordance (93.3%) was observed between RUT and histopathology, affirming RUT's reliability in clinical settings. A wide range of endoscopic abnormalities were observed, with gastritis being the most prevalent (83.3%). Notably, no statistically significant association was found between H. pylori infection and specific endoscopic findings ($p > 0.05$).

Conclusion

This study provides valuable clinical insights, highlighting a 50% prevalence of Helicobacter pylori infection among dyspeptic patients. The strong agreement between RUT and histopathological findings reinforces the reliability of RUT as a cost-effective and accessible diagnostic tool. Given its high positive predictive value, RUT can serve as an initial diagnostic method, supporting a "test and treat" approach for uninvestigated dyspepsia. Future studies should focus on optimizing eradication strategies based on regional resistance patterns and developing cost-effective screening methods.

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