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Clinicopathological profile and its association with endoscopic findings in dyspeptic patients in a tertiary care hospital: A cross-sectional study

Aarthik Shetty[1], Yeshavanth G[2], Siddesh G[3], Nikhil Kumar DG[4]

[1,4]Junior Resident, [2]Professor and Head, [3]Assistant Professor, Department of General Medicine, SSIMS&RC, Davangere, Karnataka, India

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ABSTRACT

Background: The prevalence of dyspepsia in general practice consultations ranges from 4% to 5%, whereas it accounts for approximately 20–40% of consultations in the field of gastroenterology. **Aims and Objectives:** This study was carried out with the objective of estimating the percentage of *Helicobacter pylori*-infected people who have dyspepsia and exploring the relationship between infection and clinical manifestation. **Materials and Methods:** This was a hospital-based observational study conducted at a tertiary care teaching health-care facility from January 2023 to June 2023. All 50 patients with symptoms of dyspepsia were included in the study with the help of non-probability purposive sampling after their written and informed consent. A pre-designed and pre-tested structured pro forma was used to collect detailed history, clinical findings, and endoscopic findings from patients with dyspepsia. Gastritis and ulceration characteristics were observed by endoscopy, while histopathological examination (HPE) and rapid urease test (RUT) (for confirmation of *H. pylori*) were performed on endoscopy-obtained biopsy specimens. **Results:** Mean age of the patients was 46.69 ± 15.78 with 65.4% (n = 34) being males. The sample was classified into cases positive for *H. pylori* (13; 25%) and cases negative for *H. pylori* (39; 75%), according to the RUT outcome, 21.20% (n = 11) had a history of smoking, 25% (n = 13) had Type II DM, and 25% of patients presented with upper abdominal bloating and epigastric pain. On endoscopy, the majority of patients revealed grade III (n = 22, 42.30%) gastritis and no ulceration (n = 29, 55.80%), with the maximum showing a chronic non-specific lesion (n = 20, 38.5%) on HPE. Comorbidities ($\chi^2 = 12.56$, P = 0.028), endoscopic findings ($\chi^2 = 10.50$, P = 0.032), and ulcerations ($\chi^2 = 20.02$, P < 0.001) were the significant findings associated with *H. pylori* infection. **Conclusion:** The timely identification and expeditious management of *H. pylori* infection are imperative to mitigate the occurrence of severe complications.

Key words: Dyspepsia; Gastroenterology; *Helicobacter pylori*; Gastritis

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INTRODUCTION

Dyspepsia is defined as a collection of persistent or recurring symptoms that are associated with the upper gastrointestinal (GI) tract and typically present as discomfort or pain in the epigastric region, feelings of fullness after eating, rapid satiety, bloating, nausea, eructation (belching), or heartburn.[1]

The prevalence of dyspepsia in general practice consultations ranges from 4% to 5%, whereas it accounts for approximately 20–40% of consultations in the field of gastroenterology.[2] It has been reported that 32.9% of adult dyspeptic patients in India are infected with *Helicobacter pylori*.[3] Gastritis, duodenal ulcer, gastric carcinoma, and mucosa-associated lymphoid malignancies have been linked to *H. pylori*.[4]

Address for Correspondence:
Dr. Aarthik Shetty, Junior Resident, Department of General Medicine, SSIMS&RC, Davangere, Karnataka, India. **Mobile:** +91-9900388886.
E-mail: aartk4publication@gmail.com

However, there is a dearth of literature pertaining to the clinical profile of dyspeptic patients and its correlation with *H. pylori*, particularly in the southern region of India. Therefore, this study was carried out with the objective of determining the clinical and pathological characteristics of dyspeptic individuals, as well as estimating the percentage of *H. pylori*-infected individuals who experience dyspepsia. In addition, the investigation sought to explore the potential association between *H. pylori* infection and the manifestation of clinical symptoms.

Aims and objectives

This study was carried out with the objective of estimating the percentage of Helicobacter pylori-infected people who have dyspepsia and exploring the relationship between infection and clinical manifestation.

MATERIALS AND METHODS

This was a hospital-based cross-sectional study conducted in a tertiary care teaching facility located in the southern region of India from January 2023 to June 2023. The study was carried out after getting approval from the institutional ethics committee and adhered to the principles enumerated in the Helsinki Declaration of 1975, as revised in the year 2013. The study comprised a total of 52 individuals who presented at the facility with various dyspeptic symptoms that had persisted for more than 3 months and had not been previously examined using endoscopic or radiographic methods. Participants with structural causes for dyspepsia (hiatus hernia and GERD), metabolic causes for dyspepsia (uremia, ischemic heart disease, biliary colic, and pancreatitis), use of proton pump inhibitors, antibiotics, and bismuth-containing compounds in the 4 weeks before the enrolment in the study, and patients who refused to give consent were excluded from the study. Patients were recruited with the help of non-probability purposive sampling and written and informed consent was obtained from every participant before inclusion in the study. In this study, all participants were subjected to the procedure of endoscopy, employing a conventional forward-viewing video fiberoptic endoscope. As part of the examination, two biopsy samples were collected from each individual. The initial specimen was utilized for the purpose of conducting the rapid urease test (RUT). To carry out this test, the ENDOXPERT *H. pylori* Rapid Test Kit, manufactured by a company certified under ISO 13485:2016 was employed. This particular kit relies on the detection of *H. pylori* urease activity within biopsy specimens. The findings revealed a positive outcome when there was an observed alteration in color from yellow to pink color within a time frame of 30 min subsequent to the utilization of the kit. For the purpose of this study, we categorized the participants as having *H. pylori* infection if they revealed a positive outcome on RUT.

The other biopsy specimen was immobilized in a solution of 10% buffered formalin and subsequently delivered to the pathology laboratory of the institute for the purpose of undergoing histological examination. Hematoxylin and eosin staining were employed for histological evaluation, while a modified Giemsa stain was utilized specifically for the identification of *H. pylori*. Demographic data and endoscopic findings were diligently recorded and carefully documented on a pre-designed, pre-structured pro forma for the study. The statistical analysis was carried out utilizing IBM's Statistical Package for the Social Sciences version 23 (IBM, USA). The data were initially analyzed and coded using MS Excel Office version 2021. For categorical data, frequency, and proportions were used in the descriptive analysis, whereas mean and standard deviation were used for continuous variables. The Chi-square test was applied when needed to evaluate if the categorical variables were showing any association.

RESULTS

All 52 patients were endoscopically examined for dyspeptic symptoms. The age of participants ranged from 17 to 65 years. The cases were divided into two groups: Those that tested positive for *H. pylori* (13; 25%) and those that

Table 1: Demographic characteristics and personal habits of the study participants (n=52)

Attributes	Numbers	Percentage
Sex		
Male	34	65.39
Female	18	34.61
Comorbidities		
None	17	32.69
Type II DM	13	25
Systemic hypertension	11	21.15
Drug usage	5	9.61
IHD	4	7.69
TB	2	3.84
Personal habits		
None	20	38.46
Smoking	11	21.15
Alcohol	9	17.30
Tobacco chewing	4	7.69
Altered sleep pattern	3	5.76
Caffeine	2	3.84
Skipping of meals	2	3.84
Emotional stress	1	1.92
H. pylori status		
Negative	39	75
Positive	13	25

IHD: Ischemic heart disease, TB: Tuberculosis, DM: Diabetes mellitus

tested negative for *H. pylori* (39; 75%), based on the RUT outcome (Table 1).

The mean age of the participants was 46.69±15.78 years, with the mean age of participants with *H. pylori* infection being 49.23±11.22 years and without *H. pylori* infection being 45.85±17.08 years. No statistically significant (t=0.66, P=0.50) correlation was found between the age of the patients and infection with *H. pylori* (Table 2). There was a male preponderance in the study, with 65.38% of participants being male and the rest being female. In terms of *H. pylori* cases, the majority of cases (65.39%) were males, whereas the remaining cases were females. No statistical significance (χ^2=1.02, P=0.313) was found between the gender of the patients and *H. pylori* infection (Table 2). We investigated the family history of the participants in relation to *H. pylori* infection and discovered that 12 (92.30%) out of 13 patients infected with *H. pylori* had a positive family history of the infection. There was no statistically significant (χ^2=0.251, P=0.616) association between the family history of the *H. pylori* infection and the current infection (Table 2). When we explored the presence of comorbidities, we found that the majority (32.69%) were without any comorbidities, whereas 30.76% of *H. pylori*-positive cases revealed NSAID usage. There was a statistically significant association (χ^2=12.56, P=0.028) between the presence of comorbidities and the presence of an *H. pylori* infection (Table 2). Epigastric pain emerged as the prevailing clinical presentation, with a significant proportion of participants (25%) experiencing this symptom (Table 1). In patients infected with *H. pylori*, the most commonly reported symptom was upper abdominal bloating, observed in 30.76% of cases. No statistically significant association (χ^2=12.276, P=0.198) was found between the clinical features and the presence of *H. pylori* infection (Table 2).

Table 2: Demographic characteristics and association of *H. pylori* infection in the study participants (n=52)

Variable	*H. pylori* Negative (n=39) (%)	*H. pylori* Positive (n=13) (%)	Test value (χ^2 and t value)	P-value
Sex				
Female	12 (30.76%)	6 (46.15)	1.02 (χ^2)	0.313
Male	27 (69.24)	7 (53.85)		
Age	49.23±11.26	45.85±17.08	0.66 (t)	0.509
Family history of H. pylori infection				
Negative	34 (87.17)	12 (92.30)	0.25 (χ^2)	0.616
Positive	5 (12.83)	1 (7.70)		
Comorbidities (%)				
None	15 (38.46)	2 (15.38)	12.56 (χ^2)	0.028
Type II DM	11 (28.20)	2 (15.38)		
Systemic HTN	9 (23.10)	2 (15.38)		
Drugs	1 (2.56)	4 (30.76)		
IHD	2 (5.12)	2 (15.38)		
TB	1 (2.56)	1 (7.72)		
Personal habits (%)				
None	17 (43.58)	3 (23.01)	5.57 (χ^2)	0.590
Smoking	8 (20.51)	3 (23.01)		
Alcohol	7 (17.94)	2 (15.38)		
Tobacco chewing	3 (7.69)	1 (7.72)		
Altered sleep pattern	2 (5.12)	1 (7.72)		
Skipping of meals	1 (2.56)	1 (7.72)		
Caffeine	1 (2.56)	1 (7.72)		
Emotional stress	0 (0)	1 (7.72)		
Clinical features (%)				
Upper abdominal bloating	9 (23.07)	4 (30.76)	12.276 (χ^2)	0.198
Epigastric pain	12 (30.76)	1 (7.72)		
Post-prandial fullness	7 (17.94)	1 (7.72)		
Pain relieved by antacids	4 (10.25)	3 (23.01)		
Belching	2 (5.12)	1 (7.72)		
Brashing	0 (0)	2 (15.38)		
Early satiety	1 (2.56)	1 (7.72)		
Nausea and vomiting	2 (5.12)	0 (0)		
Odynophagia	1 (2.56)	0 (0)		
Chest pain	1 (2.56)	0 (0)		

IHD: Ischemic heart disease, TB: Tuberculosis, DM: Diabetes mellitus, HTN: Hypertension

Regarding personal habits, it was found that 23.07% of patients in the *H. pylori*-positive group reported smoking, while 15.38% reported alcohol consumption. There was no observed statistical association (χ^2=5.57, P=0.590) between personal habits and the presence of *H. pylori* infection (Table 2).

Among the participants, the most prevalent endoscopic finding was a duodenal ulcer, observed in 42.30% of cases. In addition, normal findings were found in 23.10% of the participants. The most frequently observed endoscopic finding in individuals infected with *H. pylori* was the presence of a duodenal ulcer, which was found in 69.23% of *H. pylori*-positive cases. We noticed a noteworthy statistically significant association (χ^2=10.53, P=0.032) between the endoscopic findings and *H. pylori* infection (Table 3). The majority of the participants did not have any ulceration. However, the presence of ulceration was noted, with duodenal ulcers being more common than gastric ulcers. The most common type of ulceration observed in patients with *H. pylori* was found in the duodenum. The presence of ulcerations in the participants and the occurrence of *H. pylori* infection showed a strong statistical significance (χ^2=20.02, P≤0.0001) (Table 3). On histopathological examination, it was observed that chronic non-specific gastritis (53.84%) was the most commonly observed finding in patients infected with *H. pylori* followed by erosive gastritis (23.07%). The histological outcomes of the observed cases did not show any statistically significant (χ^2=11.06, P=0.086) association between the histological findings and the presence of *H. pylori* infection (Table 3).

DISCUSSION

Dyspepsia is a widely observed issue in clinical practice, with a reported impact on approximately 30–49% of the total Indian population.[5,6] A total of 52 individuals participated in the study, all of whom sought medical attention for dyspeptic symptoms that had persisted for over 3 months.

In a study, Tytgat[7] found that the mean age of the participants was 45±2.4 years. Another study by Wallace et al.[8] reported a mean age of 47.3±1.6 years for their participants. The values we observed were consistent with the findings of our study.

Based on the criteria for *H. pylori*-positive cases categorization utilized in the study, it was found that only 13 cases (25%) tested positive for *H. pylori*, whereas 39 cases (75%) tested negative. This result was consistent with those of a study by Niknam et al.[9] which showed a 31% of *H. pylori* positivity rate in adults with dyspepsia from Iran. However, a study conducted by Aftab et al.[10] found that 47% of adult dyspeptic patients were positive for *H. pylori* infection.

Studies conducted by Andrabi et al.,[11] from Kashmir, India, and Gado et al.[12] from Egypt revealed a higher number of male participants compared to females, which aligns with our findings. Our findings indicate a higher prevalence among males, likely due to factors such as alcohol consumption, smoking, and tobacco use, which are known to contribute to the development of dyspepsia.

In a study on dyspeptic patients, Gado et al.[12] found that the prominent personal habits were a history of smoking, alcohol consumption, and NSAID ingestion. These findings align with our study. The majority of ulcerations observed in our participants were found to be duodenal in

Table 3: Demographic characteristics and association of *H. pylori* infection in the study participants (n=52)

Variable	*H. pylori* Negative (n=39) (%)	*H. pylori* Positive (n=13) (%)	Chi-square value (χ^2)	P-value
Ulcerations				
Duodenal	1 (2.56)	6 (46.15)	20.02	<0.0001
Gastric	2 (5.12)	2 (15.38)		
Normal	36 (92.32)	5 (38.46)		
Endoscopic findings				
Gastritis duodenal ulcer	9 (23.07)	13 (100)	10.532	0.032
Normal mucosa	0 (0)	12 (92.30)		
Gastric ulcer	2 (5.12)	8 (61.53)		
Gastritis	1 (2.56)	6 (46.15)		
Gastric carcinoma	0 (0)	1 (7.72)		
Histopathological examination				
Chronic non-specific	13 (33.33	7 (53.84	11.06	0.08
Normal	12 (30.76)	1 (7.72)		
Erosive	5 (12.82)	3 (23.01)		
Intestine metaplasia	5 (12.82)	0		
Nodular	3 (7.69)	1 (7.72)		
Atrophic mucosa	1 (2.56)	1 (7.72)		

nature. Sumathi et al.,[13] Manes et al.,[14] and Kumar et al.[15] found a similar result.

Epigastric pain was the most frequently observed clinical presentation among patients in our study. This finding aligns with the research conducted by Tytgat[7] which also reported a high prevalence of epigastric pain among study participants.

Our study revealed that duodenal ulcerations were the most frequently observed endoscopic finding, followed by normal findings. In a study conducted by Akram et al.,[16] it was found that 40% of dyspeptic patients had normal endoscopic findings. Duodenal ulcers were observed in 18.33% of the participants. Another study by Wallace et al.[8] reported that gastritis was the main endoscopic finding among the participants. In the study conducted by El-Habab et al.,[17] it was found that a significant majority of cases (73.2%) exhibited non-erosive gastritis, closely followed by small hiatus hernia (70.9%). This contrasts with the findings of Nesland and Berstad[18] who primarily observed ulcerations during endoscopic examinations. Consistent with our findings, Helaly et al. (2009) also discovered that a majority of participants with duodenal ulcers were infected with *H. pylori*.

Limitations of the study

The limitation of the study is that it was conducted at a single center with a small sample size. A more extensive study involving multiple centers with a larger sample size on the topic would be advisable.

CONCLUSION

A thorough investigation is necessary for dyspepsia, a common condition encountered in daily practice. Upper GI endoscopy is a procedure that can be performed to promptly identify both benign and malignant lesions in patients experiencing dyspepsia. There was a significant association between *H. pylori* infection and duodenal ulcerations. Hence, timely identification and expeditious management of *H. pylori* infection are imperative to mitigate the occurrence of severe complications.

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AS- Definition of intellectual content, literature survey, prepared the first draft of a manuscript, implementation of the study protocol, data collection, and manuscript preparation; **AS, NK and YG-** Concept, design, clinical protocol, and manuscript preparation; **AS and NKDG-** Design of study, literature survey, data analysis, statistical analysis and interpretation, manuscript preparation, editing and manuscript revision, review, and submission of article.

Work attributed to:
Department of General Medicine, SSIMS&RC, Davangere, Karnataka.

Orcid ID:
Aarthik Shetty - https://orcid.org/0009-0002-4003-2704
Yeshavanth G - https://orcid.org/0000-0001-6701-1431
Dr. Siddesh G - https://orcid.org/0000-0002-8875-8435
Dr. Nikhil Kumar DG - https://orcid.org/0009-0003-6733-681X

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