Section: General Medicine

Original Research Article

UPPER GASTROINTESTINAL ENDOSCOPIC PATTERNS IN PATIENTS WITH DYSPEPSIA: A HOSPITAL-BASED STUDY FROM HALDWANI

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ABSTRACT

Background: Dyspepsia is a common cause of morbidity and prompts frequent healthcare use. Upper gastrointestinal endoscopy (UGIE) is the key investigation to distinguish organic from functional causes and to detect pathologies such as gastritis, peptic ulcer disease and malignancy. The objective is to describe the clinico-demographic profile and upper GI endoscopic findings in patients presenting with dyspepsia at a tertiary care centre in Haldwani, Uttarakhand.

Materials and Methods: This hospital-based cross-sectional study included 230 patients ≥16 years meeting Rome III criteria for dyspepsia, recruited over an 18-month period after institutional ethical approval. Baseline clinical data, lifestyle factors, UGIE findings and Helicobacter pylori status were recorded. Data were analysed using descriptive statistics and chi-square tests to assess associations between categorical variables (significance at $p < 0.05$). All data reported are from the present study conducted at Dr. Susheela Tiwari Memorial Government Hospital, GMC Haldwani.

Results: Of 230 patients, 52.6% were female and 55.2% were aged 21–40 years; 71.7% were urban residents. Common symptoms were epigastric pain (57.8%) and postprandial fullness (51.3%). Mean BMI was 24.08 ± 2.19. Endoscopy showed mild antral gastritis in 29.1% and moderate antral gastritis in 12.2%; gastric ulcer in 5.7% and gastric carcinoma in 1.7%. Esophagitis was present in 21.7% (erosive 0.9%); duodenal ulcer was rare (0.4%). Hiatus hernia was seen in 21.3%, and combined esophagitis + gastritis in 17.0%. H. pylori was detected in 77.4% (178/230). H. pylori positivity was significantly associated with stomach pathology ($\chi^2 = 4.55$, $p = 0.033$) and with overall GI findings ($\chi^2 = 20.613$, $p = 0.0000056$).

Conclusion: In this tertiary-centre cohort, gastritis (particularly antral) was the commonest endoscopic finding in dyspepsia; H. pylori infection was highly prevalent and strongly associated with endoscopic abnormalities. These results support targeted endoscopic evaluation for patients with alarm features or refractory symptoms and highlight the importance of H. pylori detection and management in this population.

Keywords: Dyspepsia, upper gastrointestinal endoscopy, helicobacter pylori, gastritis.

INTRODUCTION

Dyspepsia is one of the most common gastrointestinal complaints encountered in both primary care and specialist practice. The Rome IV criteria further refine this definition, describing dyspepsia as chronic or recurrent upper abdominal pain or discomfort, including early satiety,

postprandial fullness, and epigastric burning in the absence of structural disease on routine clinical evaluation or imaging.[1] Patients with such symptomatology may harbor significant gastrointestinal (GI) pathologies, including gastritis, peptic ulcer disease, gastroesophageal reflux disease (GERD), or malignancy. When upper gastrointestinal endoscopy (UGIE) reveals no organic pathology, the condition is categorized as functional dyspepsia.[2]

The global burden of dyspepsia is substantial. Meta-analyses estimate that approximately 20–30% of the population is affected at any given time, although prevalence may reach up to 50% in parts of Asia.[3] In India, the prevalence is also high, with studies suggesting that up to a quarter of the adult population experience dyspeptic symptoms at some point.[4] While dyspepsia is rarely life-threatening, it exerts a disproportionate impact on health systems by prompting frequent physician visits, polypharmacy, and repeated investigations. More importantly, the chronicity of symptoms affects patients' quality of life, productivity, and mental well-being.[5]

Functional dyspepsia, which accounts for the majority of cases, is considered a disorder of gut–brain interaction. Proposed mechanisms include visceral hypersensitivity, delayed gastric emptying, impaired gastric accommodation, altered central processing of visceral signals, Helicobacter pylori infection, and psychosocial stressors.[6] Conversely, organic dyspepsia arises from structural or biochemical abnormalities, such as peptic ulcer disease, GERD, or gastric malignancy, often linked to H. pylori infection or prolonged nonsteroidal anti-inflammatory drug (NSAID) use.[7]

Helicobacter pylori plays a central role in the etiopathogenesis of dyspepsia worldwide. Its prevalence remains high in India, ranging between 50% and 80% depending on geographic and socioeconomic factors.[8] The bacterium is implicated not only in functional symptom generation but also in organic disease, including gastritis, peptic ulcer disease, mucosa-associated lymphoid tissue (MALT) lymphoma, and gastric cancer. Consequently, a "test-and-treat" strategy for H. pylori is widely endorsed in dyspeptic patients under 50 years without alarm features.[7]

The clinical approach to dyspepsia emphasizes early recognition of alarm symptoms such as unintentional weight loss, anemia, gastrointestinal bleeding, persistent vomiting, or family history of upper GI malignancy. These features warrant immediate endoscopic evaluation.[5] Endoscopy remains the gold standard for differentiating between organic and functional dyspepsia, enabling direct visualization of the upper GI mucosa, detection of structural abnormalities, biopsy for H. pylori, and, importantly, early detection of neoplastic lesions. Despite being invasive and resource-intensive, UGIE provides invaluable diagnostic and therapeutic benefits, particularly in patients over 50 years of age or those with persistent or refractory symptoms.[9]

In India, epidemiological studies highlight the significant role of lifestyle and environmental factors in dyspepsia prevalence and severity. Diets rich in spices and fats, high rates of tobacco and alcohol use, stress, and widespread H. pylori infection contribute to the increased burden.[10] Regional variations further complicate the clinical landscape. For example, urban populations often show higher prevalence due to dietary shifts and sedentary lifestyles, whereas rural populations demonstrate higher H. pylori–related organic disease owing to sanitation and hygiene factors.[8]

Several Indian studies have examined the endoscopic spectrum of dyspepsia, showing that gastritis, peptic ulcers, GERD, and, less frequently, malignancies are among the common findings.[11,12] Nevertheless, a considerable proportion of patients, up to 40% in some series, exhibit normal endoscopic findings, underscoring the high prevalence of functional dyspepsia.[13] Importantly, research from tertiary centers in North India has revealed a higher incidence of gastric cancer than expected in younger patients, challenging the applicability of Western age-based cutoffs for endoscopy in the Indian context.[14]

Recent studies continue to expand the understanding of dyspepsia and its associated conditions. Sundar (2025) highlighted how different subtypes of dyspepsia significantly influence patients' quality of life, underscoring the importance of patient-reported outcomes in clinical evaluation.[15] Bandyopadhyay and Kolatkar (2025) compared diabetic and non-diabetic populations in India, showing a higher prevalence of gastric dysrhythmias and upper GI symptoms in diabetics, thus linking metabolic disease with functional dyspepsia.[16] Malik et al. (2024), in a prospective study of gallstone patients with dyspepsia, reported abnormal endoscopic findings in 66%, with gastritis being the most frequent lesion, and noted that Helicobacter pylori was positive in 75% of cases; symptom relief was observed in nearly two-thirds after cholecystectomy.[17] Balamurali et al. (2024) examined chronic kidney disease patients and described a wide spectrum of endoscopic abnormalities, reflecting the gastrointestinal impact of systemic disease.[18] Ahmad et al. (2024) provided valuable insights into the age-stratified prevalence and antibiotic resistance patterns of H. pylori among dyspeptic patients, drawing attention to the rising resistance against commonly used antibiotics.[19] Similarly, Konduk et al. (2023) investigated the role of H. pylori in duodenitis, reinforcing its pathogenic association in dyspeptic patients.[20] Collectively, these recent studies highlight the multifactorial nature of dyspepsia and the continued clinical relevance of endoscopic evaluation and H. pylori detection in diverse populations.

MATERIALS AND METHODS

This hospital-based cross-sectional study was conducted in the Department of General Medicine at Dr. Susheela Tiwari Memorial Government Hospital, Government Medical College, Haldwani, Nainital, Uttarakhand. The study was carried out over a period of 18 months after obtaining prior approval from the Institutional Ethical Committee and administrative permission from the hospital authorities.

A total of 230 patients with symptoms of dyspepsia were enrolled consecutively from both outpatient and inpatient services of the Department of General Medicine. Patients above 16 years of age who fulfilled the Rome III definition of dyspepsia were included. According to this definition, dyspepsia is characterized by one or more of the following symptoms: postprandial fullness, early satiety, or epigastric pain or burning for at least three months, with symptom onset at least six months before diagnosis. Patients below 16 years of age, those taking non-steroidal anti-inflammatory drugs, and those unwilling to give informed consent were excluded from the study.

After obtaining written informed consent, each patient underwent a detailed clinical evaluation, which included recording demographic details, medical history, and lifestyle factors. A thorough physical examination was performed in all cases. Baseline investigations were conducted in the Departments of Biochemistry and Pathology at GMC Haldwani. All patients underwent upper gastrointestinal endoscopy. Endoscopic findings were systematically documented in a predesigned proforma, and abnormalities such as esophagitis, gastritis, peptic ulcer disease, hiatus hernia, and malignancy were carefully noted. Biopsy or histopathological confirmation of endoscopic lesions was not performed as part of this study.

Data obtained from each patient were coded, entered into a database, and checked for accuracy and consistency. Statistical analysis was carried out using Microsoft Excel. Descriptive statistics including means, frequencies, and percentages were used to summarize demographic, clinical, and endoscopic variables. Associations between categorical variables were tested using the Chi-square test, and a p-value of less than 0.05 was considered statistically significant. Ethical approval for the study was obtained from the Institutional Ethical Committee of Government Medical College, Haldwani. Written informed consent was obtained from all participants after explaining the study procedure, and confidentiality of personal data was maintained throughout the research.

RESULTS

In the present study, there was a slight predominance of females (52.6%) over males (47.4%), and the majority of patients belonged to the 21–40-year age group (55.2%). Out of the 230 dyspeptic patients who underwent upper gastrointestinal endoscopy, females accounted for 121 cases, representing 52.6 percent of the study population, while males constituted 109 cases, amounting to 47.4 percent.

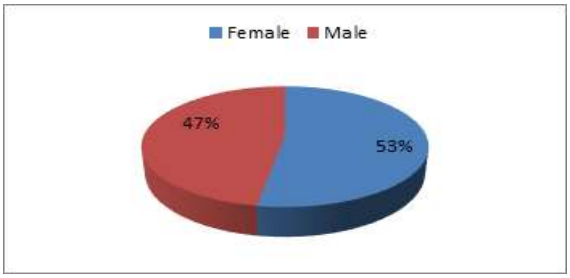

Figure 1: Gender-Wise Distribution of Dyspeptic Patients

More than half of the study population (53.0%) had education at the graduate level or above, while nearly half (45.2%) had only school-level education (ranging from primary to higher secondary). This is depicted by [Table 1]. A very small proportion (1.3%) were illiterate, and one record (0.4%) lacked educational information.

Table 1: Distribution on the basis of literacy rate

Education Category	Number of Patients	Percentage (%)
Graduate and above	122	53.3
School level	104	45.4
Illiterate	4	1.3
Total	230	100.0

Majority of dyspeptic patients undergoing upper gastrointestinal endoscopy were from urban areas, comprising 71.7 percent of the study population, while 28.3 percent were from rural areas. The higher representation of urban patients may be due to greater healthcare accessibility, proximity to the tertiary care centre, and higher awareness about gastrointestinal symptoms in urban populations. This is represented by [Figure 2].

The mean Body Mass Index (BMI) of the study population is 24.08 with a standard deviation of 2.19. This indicates that, on average, the patients have a BMI slightly above the normal range.

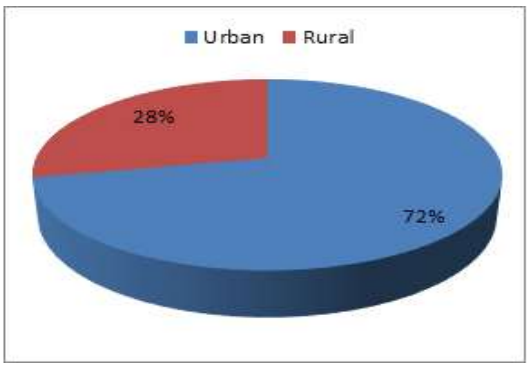

Figure 2: Distribution of dyspeptic patients according to place of residence

Various lifestyle and medication-related factors were observed in Table 2. Smoking history was present in 11.3% of the participants, while 13.5% reported alcohol consumption. Tobacco chewing was relatively uncommon, seen in only 2.6% of the patients. Excessive consumption of coffee or tea was noted in 19.1% of individuals. More than half of the study population, 52.6%, reported experiencing a stressful life.

Table 2: Distribution of Lifestyle and Medication-related Factors Among Study Participants

Factor	Number of Patients	Percentage (%)
Smoking History	26	11.3%
Alcohol Consumption	31	13.5%
Tobacco Chewing	6	2.6%
Excess Coffee/Tea Intake	44	19.1%
Stressful Life	121	52.6%
Complementary Medications	13	5.7%
NSAID Intake	41	17.8%

Use of complementary medications was reported by 5.7% of patients, and 17.8% had a history of non-steroidal anti-inflammatory drug (NSAID) intake. These findings suggest that stress and lifestyle habits such as coffee/tea consumption, smoking, and NSAID use are notable factors among dyspeptic patients attending the tertiary care center.

[Table 3] notes the distribution of gastrointestinal symptoms. Epigastric pain was the predominant symptom, reported by 133 patients, accounting for 57.8% of the study population. This aligns with epigastric pain being a hallmark complaint in dyspepsia, often indicating underlying mucosal irritation or inflammation in the upper gastrointestinal tract. Postprandial fullness was the second most common symptom, present in 118 patients (51.3%). This symptom reflects a sensation of early satiety or uncomfortable fullness after eating, which can be suggestive of impaired gastric emptying or functional dyspepsia. Whereas, bloating was reported by 65 patients (28.3%), indicating a substantial proportion experienced abdominal distension or a feeling of fullness unrelated to food intake alone. Early satiety was the least frequent symptom, affecting 26 patients (11.3%). Although less common, early satiety can have significant clinical implications, often pointing toward delayed gastric emptying or more severe functional impairment.

Table 3: Frequency of Gastrointestinal Symptoms Among Study Participants

Symptom	Number of Patients	Percentage (%)
Epigastric Pain	133	57.8%
Epigastric Discomfort	44	19.1%
Bloating	65	28.3%
Postprandial Fullness	118	51.3%
Early Satiety	26	11.3%

The most common gastric abnormality in this study was mild antral gastritis (29.1%), followed by moderate antral gastritis (12.2%). Severe lesions such as gastric ulcers (5.7%) and carcinoma (1.7%) were less frequent. Mwakalapuka et al. (2016) found gastritis in 61.1% of cases and peptic ulcer disease in 24.1%, while gastric cancer accounted for 6.7%, slightly higher than in our series.[21] A retrospective study in Qatar by Al-Enezi et al. (2020) reported gastritis in 65.5% and gastric ulcer in 4.6%, with carcinoma in only 0.54%, which closely parallels our ulcer and carcinoma rates.[22] Esophagitis was seen in 21.7% of our patients. Gastric ulcers were identified in 5.7% of patients, reflecting a significant subset with more severe mucosal damage. Gastric carcinoma, a serious and potentially life-threatening condition, was detected in 1.7% of the study group. Less common findings included biliary gastritis, found in 0.4% of patients respectively. These results highlight that gastritis in its mild form is the predominant pathological finding in dyspeptic patients undergoing upper gastrointestinal endoscopy, while more severe lesions like ulcers and carcinoma occur less frequently but remain clinically important. This is reflected by [Table 4].

Table 4: Frequency and Percentage Distribution of Stomach Findings (n = 230)

Stomach Finding	Frequency	Percentage (%)
Mild antral gastritis	67	29.1%
Moderate antral gastritis	28	12.2%
Mild-moderate antral gastritis	2	0.9%
Pangastritis	9	3.9%
Erosive gastritis	9	3.9%
Gastric ulcer	13	5.7%
Gastric carcinoma	4	1.7%
Biliary gastritis	1	0.4%

Esophageal abnormalities were observed in a subset of cases. Esophagitis, which refers to inflammation of the esophageal mucosa without visible erosions, was the most frequently encountered esophageal finding, present in 21.7% of patients, as reflected by [Figure 3].

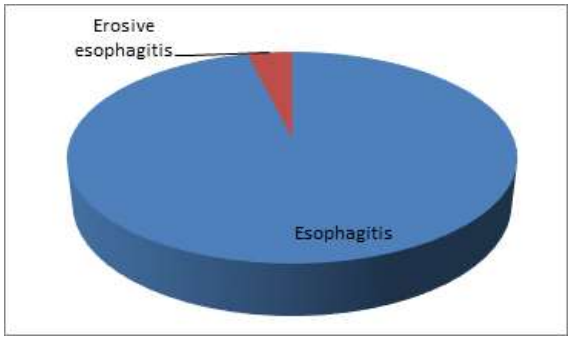

Figure 3: Esophageal Findings

Duodenal abnormalities were rare. Only one patient (0.4%) was found to have a duodenal ulcer on upper gastrointestinal endoscopy. The vast majority of patients, 99.6%, showed no abnormal findings in the duodenum.

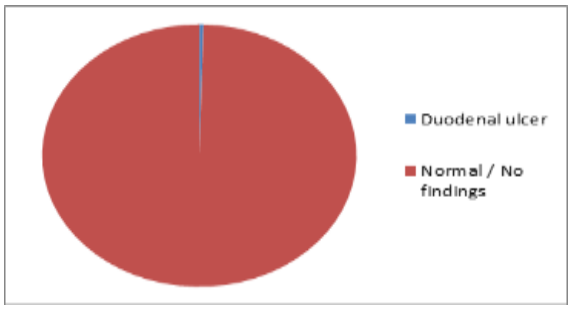

Figure 4: Duodenal Findings

Hiatus hernia was observed in 21.3% of cases, making it a relatively common anatomical abnormality. Hiatus hernia occurs when a portion of the stomach protrudes through the diaphragm into the chest cavity, which can contribute to symptoms like reflux and dyspepsia. In contrast, a lax lower esophageal sphincter (LES), which can lead to impaired closure of the esophagus and promote acid reflux, was less frequently identified, seen in only 2.6% of patients.

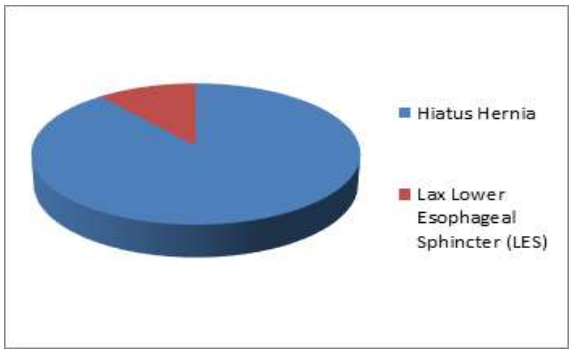

Figure 5: Hiatus Hernia and Lax Lower Esophageal Sphincter (LES) Findings

Helicobacter pylori infection was identified in 77.4% of the patients, indicating that more than three-fourths of the study population tested positive for the bacterium. This high prevalence underscores the significant role of H. pylori as an etiological factor in the gastrointestinal complaints observed in these patients. This is represented by [Figure 6].

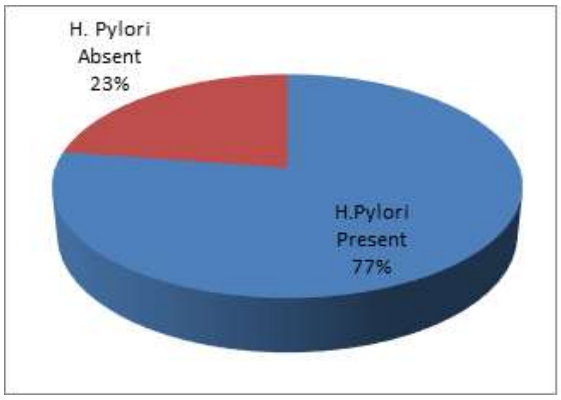

Figure 6: Helicobacter pylori Infection Status Among Study Participants

A statistically significant association was found between Helicobacter pylori positivity and the presence of stomach findings ($\chi^2 = 25.02$, p-value = 0.00001). This suggests that patients with H. pylori infection were more likely to have identifiable stomach pathology on endoscopy compared to those without the infection. Since the p-value is less than 0.05, the null hypothesis of no association is rejected, indicating a meaningful relationship between these two variables. Additionally, The chi-square value ($\chi^2 = 35.25$, df = 1) with a p-value of 0.0001 indicates a highly significant association between H. pylori positivity and the presence of GI findings. This suggests that patients with H. pylori

infection were substantially more likely to present with GI findings compared to those without the infection. The strength of association is strong, and the result is unlikely to be due to chance.

DISCUSSION

The manuscript reports a hospital-based cross-sectional study of 230 adult patients with dyspepsia (Rome III criteria) undergoing upper gastrointestinal endoscopy at a tertiary centre in Haldwani. The cohort was slightly female-predominant (52.6%) and concentrated in the 21–40 year age group; most patients were urban residents. Endoscopic findings were dominated by antral gastritis (mild 29.1%, moderate 12.2%), with less frequent but clinically important lesions such as gastric ulcer (5.7%) and gastric carcinoma (1.7%). Esophagitis and hiatus hernia were each seen in about one-fifth of patients (21.7% and 21.3% respectively), while duodenal ulcer was rare (0.4%). Helicobacter pylori was detected in a high proportion (77.4%) and the authors report a strong, statistically significant association between H. Pylori positivity and both stomach-specific and overall GI endoscopic abnormalities.

While the findings reinforce the predominance of gastritis and the high burden of H. Pylori among dyspeptic patients in this tertiary-care, largely urban sample, several methodological issues limit interpretation and should be addressed before publication or clinical translation. Most importantly, the manuscript contains internally inconsistent reporting of chi-square statistics and p-values (different χ^2/p pairs appear in the abstract versus the results), which requires correction and uniform presentation. Histopathological confirmation and biopsy-based H. Pylori testing were not performed (endoscopic visual diagnosis only), and the consecutive, hospital-based sampling at a tertiary centre with urban predominance introduces selection bias that likely inflates detection of organic disease relative to community estimates; additionally, analysis was limited to univariate (chi-square) tests using Excel with no multivariable adjustment for confounders (age, NSAID use, smoking, stress). Given these limitations, the paper's recommendations — targeted endoscopy for alarm features and emphasis on H. Pylori detection/eradication — are reasonable but would be strengthened by standardized diagnostic criteria (Rome IV), biopsy/histology or validated H. Pylori testing, consistent statistical reporting, and multivariable analysis to confirm independent associations.

CONCLUSION

The present study conducted on 230 dyspeptic patients undergoing upper gastrointestinal endoscopy highlights important demographic, clinical, and pathological trends in this population. Dyspepsia was more common in females and was most frequently observed in the 21–40 years age group. A majority of patients belonged to urban areas and the upper middle socio-economic class, with lifestyle factors such as stress, excess tea/coffee intake, smoking, alcohol use, and NSAID consumption contributing notably.

Endoscopic evaluation revealed that mild antral gastritis was the most common gastric lesion, followed by moderate gastritis, with severe findings such as peptic ulcer and carcinoma being less frequent. Esophagitis emerged as the predominant esophageal abnormality, while duodenal and combined stomach–duodenal lesions were uncommon. Hiatus hernia was also observed in a significant proportion of cases. A striking feature was the high prevalence of Helicobacter pylori infection, seen in more than three-fourths of patients.

Statistical analysis confirmed a significant association between Helicobacter pylori infection and both stomach and overall gastrointestinal findings, underscoring its role in the pathogenesis of organic dyspepsia. Functional dyspepsia was noted in only 24.7% of patients, while 76.3% had organic lesions detectable on endoscopy, reflecting the predominance of structural pathology in this cohort.

Overall, the findings reaffirm the critical role of upper gastrointestinal endoscopy in the evaluation of dyspeptic patients, particularly in high-prevalence regions for Helicobacter pylori. Routine endoscopic assessment combined with timely detection and eradication of Helicobacter pylori can help prevent progression to more serious gastrointestinal diseases, reduce morbidity, and guide more effective treatment strategies.

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