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Original Article

Spectrum of Upper Gastrointestinal Endoscopic Diagnoses in Patients Presenting with Dyspepsia

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ABSTRACT

Background: Dyspepsia is a common upper gastrointestinal symptom complex with diverse functional and organic causes, and upper GI endoscopy enables identification of the broad spectrum of underlying lesions, from normal mucosa to significant pathological conditions. Therefore, this study aimed to determine the spectrum of upper gastrointestinal endoscopic diagnoses among patients presenting with dyspepsia. **Methods & Materials:** This prospective observational study was conducted at the Department of Medicine, Khawaja Yunus Ali Medical Hospital, Sirajganj, Bangladesh, from January to June 2024, among 300 patients with dyspepsia undergoing upper gastrointestinal endoscopy. Eligible patients aged ≥18 years were included based on predefined criteria. Demographic, clinical, and endoscopic data were collected and analyzed using IBM SPSS Statistics version 25.0. Results were expressed as frequency, percentage, and mean ± SD, and the chi-square test assessed the association between age group and endoscopic findings, with $p < 0.05$ considered significant. **Results:** Among 300 patients, the mean age was 42.9 ± 15.3 years, with 41–50 years predominating (26.7%), and females comprising 53.0%. Upper abdominal pain (55.7%) was the most common symptom, while smoking was the leading risk factor (10.0%). Endoscopy was normal in 56.3%, whereas 43.7% had abnormalities, predominantly gastritis/duodenitis (18.7%) and pre-pyloric erosion (17.0%). Abnormal endoscopic findings increased with age up to 51–60 years but showed no significant association with age ($\chi^2 = 2.51$, $p = 0.642$). **Conclusion:** Dyspepsia commonly presents without significant structural abnormalities on endoscopy, while gastroduodenal inflammatory and erosive lesions are the predominant organic findings.

Keywords: *Dyspepsia, Upper Gastrointestinal Endoscopy, Esophagogastroduodenoscopy, Endoscopic Findings, Gastrointestinal Disorders*

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INTRODUCTION

Dyspepsia is among the most frequently encountered gastrointestinal complaints in clinical practice and affects a considerable proportion of adults worldwide. It is a common upper gastrointestinal (GI) symptom complex and, although the term literally refers to difficult digestion, it does not represent a specific diagnosis. Rather, it describes a constellation of symptoms arising from the upper abdomen, including epigastric pain or burning, abdominal bloating, early satiety, belching, postprandial fullness, nausea, and/or vomiting [1]. According to the "Rome III criteria," dyspepsia is defined by the presence of one or more of three symptoms—postprandial fullness, early satiety, or epigastric pain or burning—occurring for 3 months within the first 6 months following symptom onset [2]. The global prevalence of dyspepsia has been estimated at approximately 20–30%, whereas studies from India have reported a prevalence of around 30–49% [3].

The underlying etiology of dyspepsia is heterogeneous and encompasses both functional and organic causes. Although functional dyspepsia constitutes the majority of cases, organic etiologies include gastritis, gastroesophageal reflux disease (GERD), peptic ulcer disease, duodenitis, hiatal hernia, and upper gastrointestinal malignancies. Dyspepsia can also be associated with serious GI pathological conditions, including ulcer, stricture, and malignancy [4]. An identifiable organic cause is found in approximately 40% of patients presenting with dyspeptic symptoms; when no specific cause is identified, the condition is classified as functional or non-ulcer dyspepsia. Distinguishing functional dyspepsia from organic dyspepsia is important for appropriate management and prognostication. Studies have also reported a broad spectrum of endoscopic findings in patients with dyspepsia, ranging from normal mucosal appearances to clinically significant pathological lesions.

Upper gastrointestinal (GI) endoscopy, also referred to as esophagogastroduodenoscopy (EGD), is regarded as the gold standard diagnostic modality for assessment of the upper gastrointestinal tract. Through direct visualization of the esophagus, stomach, and duodenum, it permits identification of mucosal abnormalities, ulcers, inflammatory lesions, and neoplastic conditions [5]. Esophagogastroduodenoscopy (EGD) is therefore an important diagnostic investigation in the evaluation of patients with upper gastrointestinal symptoms, with dyspeptic symptoms being among the most common indications for upper GI endoscopy [6]. The procedure is considered reliable and diagnostically advantageous, with the additional ability to obtain biopsies and perform therapeutic interventions when indicated. A normal endoscopic examination may also provide considerable reassurance to patients and may contribute to reduced medication use, fewer medical consultations, decreased anxiety, and greater patient satisfaction. Understanding the prevalence and distribution of endoscopic findings can consequently assist clinicians in making appropriate decisions regarding diagnostic evaluation and treatment strategies.

Dyspepsia may occur in association with a range of benign gastrointestinal (GI)

diseases [7] and may also be a presenting symptom of both early and advanced gastric cancer [8]. Upper GI endoscopy (UGIE) provides important diagnostic information in patients with gastroduodenal disorders and helps establish the underlying causes of upper GI disease, thereby facilitating more precise management. In Asian patients presenting with simple dyspepsia, an increase in disease frequency has been associated with advancing age, particularly among those older than 45 years [9]. Nevertheless, the spectrum and relative distribution of endoscopic findings may differ according to age, population characteristics, risk factors, and the clinical setting. Consequently, assessing the spectrum of endoscopic diagnoses among patients presenting with dyspepsia in different clinical settings is important for determining the burden and pattern of both organic and non-organic disease. Therefore, this study was conducted to determine the spectrum of upper gastrointestinal endoscopic diagnoses among patients presenting with dyspepsia.

Objective

To determine the spectrum of upper gastrointestinal endoscopic diagnoses among patients presenting with dyspepsia.

METHODS & MATERIALS

This prospective observational study was conducted at the Department of Medicine, Khawaja Yunus Ali Medical Hospital, Sirajganj, Bangladesh, from January to June 2024. A total of 300 patients presenting with dyspepsia and undergoing upper gastrointestinal endoscopy during the study period were included based on predefined eligibility criteria. The study evaluated the demographic and clinical characteristics of the participants and assessed the spectrum of upper gastrointestinal endoscopic diagnoses.

Inclusion Criteria

i. Patients aged 18 years or older presenting with symptoms of dyspepsia.
ii. Patients who underwent upper gastrointestinal endoscopy during the study period.
iii. Patients who provided informed consent to participate in the study.
iv. Patients with complete relevant clinical and endoscopic records.

Exclusion Criteria

i. Patients with previously diagnosed upper gastrointestinal malignancy.
ii. Patients with a history of upper gastrointestinal surgery.
iii. Patients with acute gastrointestinal bleeding requiring emergency intervention.
iv. Patients unwilling or unable to provide informed consent.
v. Patients with incomplete clinical or endoscopic records.

Clinical evaluation was performed for all eligible patients, and demographic and clinical information including age, sex, dyspeptic symptoms, co-morbidities, relevant risk factors, and physical examination findings was recorded using a structured data collection form. All participants subsequently underwent upper gastrointestinal endoscopy, and the findings were documented and categorized as normal endoscopy (NUD), gastritis/duodenitis, pre-pyloric erosion, antral erosion, congestive gastropathy, esophageal varices, gastric carcinoma, antral growth, gastric polyp, GERD, or esophagitis. Data were entered, processed, and analyzed using IBM SPSS Statistics version 25.0. Categorical variables were presented as frequency and percentage, while continuous variables were expressed as mean ± standard deviation. The association between age group and normal or abnormal endoscopic findings was assessed using the chi-square (χ^2) test, with $p < 0.05$ considered statistically significant.

RESULTS

The majority of patients were aged 41–50 years (80 patients, 26.7%), followed by those aged 31–40 years (71 patients, 23.7%) and 51–60 years (61 patients, 20.3%), with a mean age of 42.9 ± 15.3 years. Patients aged ≤30 years and >60 years accounted for 48 (16.0%) and 40 (13.3%) patients, respectively. Female patients predominated, comprising 159 (53.0%) of the study population, while 141 (47.0%) were male.

Table I

Demographic Characteristics of the Study Participants (*n* = 300).

Variable		Frequency (n)	Percentage (%)
Age group (years)	≤30	48	16.0
	31–40	71	23.7
	41–50	80	26.7
	51–60	61	20.3
	>60	40	13.3
	Mean ± SD (years)	42.9 ± 15.3	
Gender	Male	141	47.0
	Female	159	53.0
	Total	300	100.0

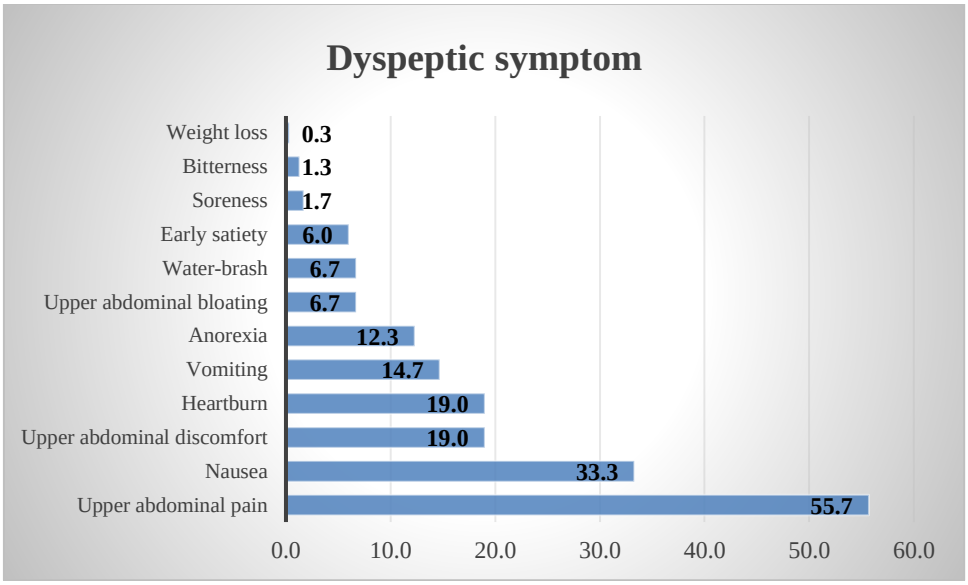
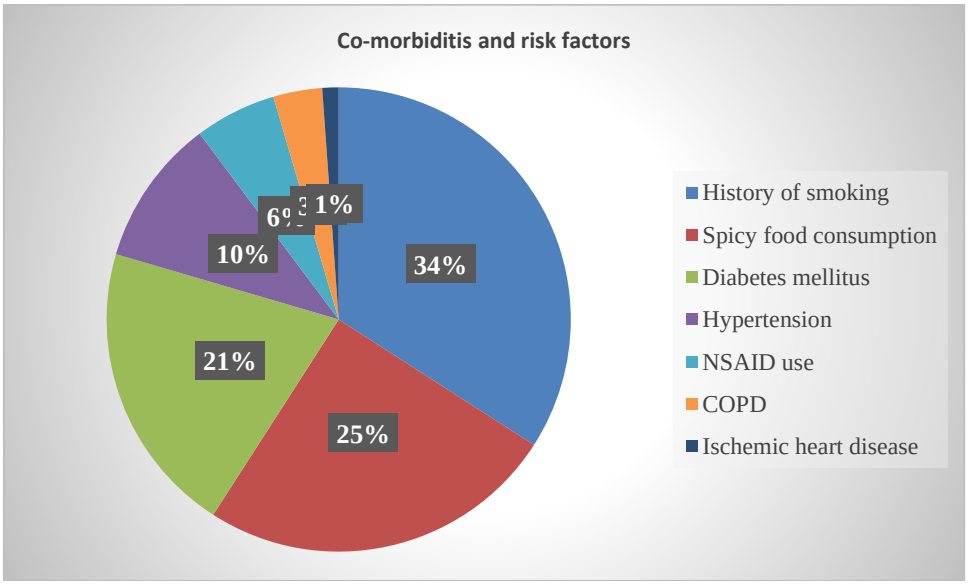


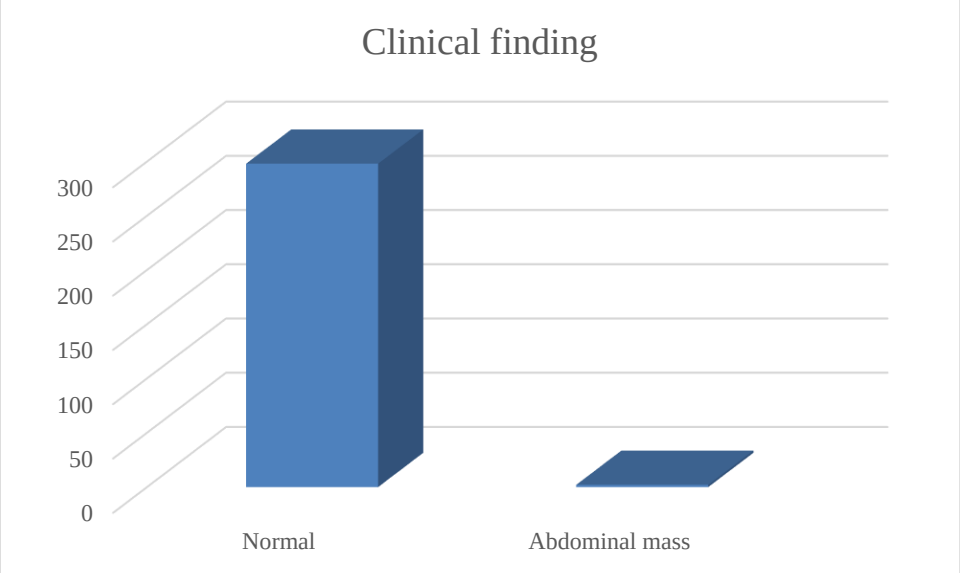
Figure 1 Distribution of Dyspeptic Symptoms Among the Study Participants (*n* = 300).

Upper abdominal pain was the most frequently reported dyspeptic symptom, occurring in 167 patients (55.7%), followed by nausea in 100 (33.3%). Upper abdominal discomfort and heartburn were each reported by 57 patients (19.0%), while vomiting was present in 44 (14.7%) and anorexia in 37 (12.3%). Upper abdominal bloating and water-brash were each reported by 20 patients (6.7%), followed by early satiety in 18 (6.0%). Soreness, bitterness, and weight loss were less frequently reported, occurring in 5 (1.7%), 4 (1.3%), and 1 (0.3%) patient, respectively. Multiple symptoms could be reported by individual patients; therefore, the percentages do not sum to 100%.

Table II
Distribution of Co-morbidities, Relevant Risk Factors, and Clinical Signs Among the Study Participants (*n* = 300).

Variable		Frequency (n)	Percentage (%)
Co-morbidities/risk factors	History of smoking	30	10.0
	Spicy food consumption	22	7.3
	Diabetes mellitus	18	6.0
	Hypertension	9	3.0
	NSAID use	5	1.7
	COPD	3	1.0
	Ischemic heart disease	1	0.3
Clinical signs	Normal	298	99.3
	Abdominal mass	2	0.7
	Total	300	100.0

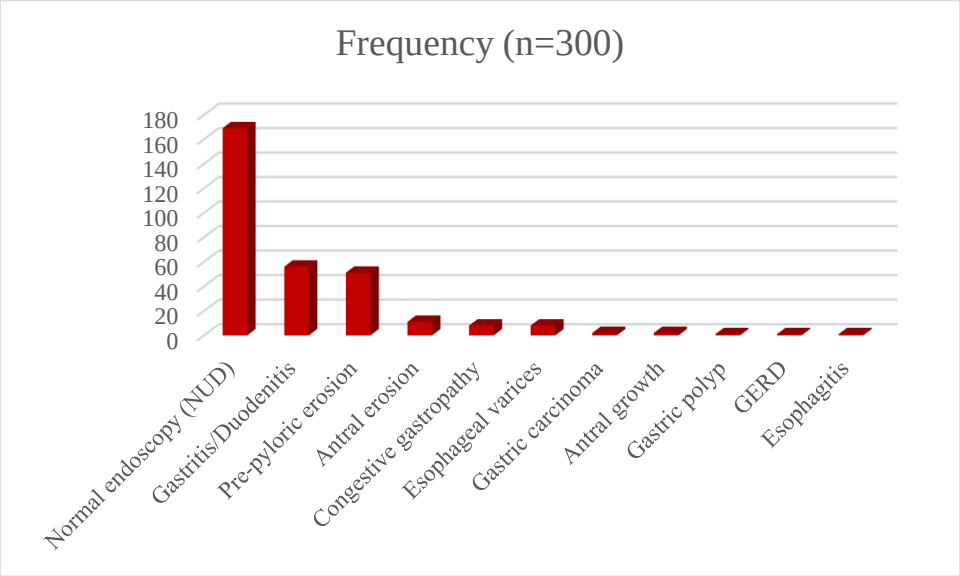




Among the recorded co-morbidities and relevant risk factors, a history of smoking was the most common, reported in 30 patients (10.0%), followed by spicy food consumption in 22 (7.3%) and diabetes mellitus in 18 (6.0%). Hypertension was present in 9 patients (3.0%), while NSAID use, COPD, and ischemic heart disease were reported in 5 (1.7%), 3 (1.0%), and 1 (0.3%) patient, respectively. On clinical examination, the vast majority of patients had no abnormal clinical signs (298 patients, 99.3%), whereas an abdominal mass was detected in 2 patients (0.7%).

Table III
Spectrum of Upper Gastrointestinal Endoscopic Diagnoses Among the Study Participants (*n* = 300).

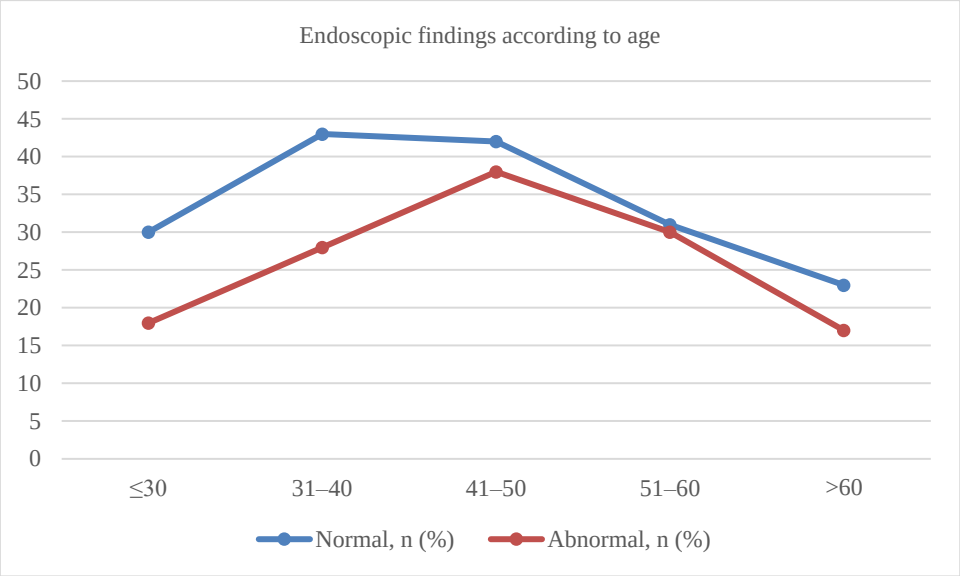
Endoscopic diagnosis/finding	Frequency (n)	Percentage (%)
Normal endoscopy (NUD)	169	56.3
Gastritis/Duodenitis	56	18.7
Pre-pyloric erosion	51	17.0
Antral erosion	11	3.7
Congestive gastropathy	8	2.7
Esophageal varices	8	2.7
Gastric carcinoma	2	0.7
Antral growth	2	0.7
Gastric polyp	1	0.3
GERD	1	0.3
Esophagitis	1	0.3
Total	300	100.0



Normal upper gastrointestinal endoscopy was observed in 169 patients (56.3%), whereas abnormal endoscopic findings were identified in 131 (43.7%) patients. Among the abnormal findings, gastritis/duodenitis was the most frequent diagnosis, occurring in 56 patients (18.7%), followed by pre-pyloric erosion in 51 (17.0%) and antral erosion in 11 (3.7%). Congestive gastropathy and esophageal varices were each identified in 8 patients (2.7%). Gastric carcinoma and antral growth were each observed in 2 patients (0.7%), while gastric polyp, GERD, and esophagitis were each identified in 1 patient (0.3%).

Table IV
Distribution of Normal and Abnormal Endoscopic Findings According to Age Group (*n* = 300).

Age group (years)	Normal, n (%)	Abnormal, n (%)	Total	χ^2	p-value
≤30	30 (62.5)	18 (37.5)	48		
31–40	43 (60.6)	28 (39.4)	71		
41–50	42 (52.5)	38 (47.5)	80		
51–60	31 (50.8)	30 (49.2)	61		
>60	23 (57.5)	17 (42.5)	40		
Total	169 (56.3)	131 (43.7)	300	2.51	0.642



Normal endoscopy was observed in 30 patients (62.5%) aged ≤30 years, 43 (60.6%) aged 31–40 years, 42 (52.5%) aged 41–50 years, 31 (50.8%) aged 51–60 years, and 23 (57.5%) aged >60 years. Abnormal endoscopic findings were present in 18 (37.5%), 28 (39.4%), 38 (47.5%), 30 (49.2%), and 17 (42.5%) patients in the respective age groups. There was no statistically significant association between age group and endoscopic status ($\chi^2 = 2.51$, $p = 0.642$).

DISCUSSION

In this prospective observational study conducted at Khawaja Yunus Ali Medical Hospital, Sirajganj, a broad spectrum of upper gastrointestinal endoscopic findings was observed among patients presenting with dyspepsia. Normal endoscopy was found in more than half of the participants, while gastritis/duodenitis and pre-pyloric erosion were the predominant abnormal findings; however, the distribution of normal and abnormal endoscopic findings did not differ significantly across age groups.

The present study evaluated the demographic and clinical characteristics and endoscopic spectrum of 300 patients presenting with dyspepsia. The mean age of the participants was 42.9 ± 15.3 years, with the largest proportion belonging to the 41–50-year age group (26.7%), followed by 31–40 years (23.7%) and 51–60 years (20.3%). This predominance of middle-aged participants is broadly consistent with previous Bangladeshi studies. Nessa et al.[10], in a study of 105 dyspeptic patients, reported a lower mean age of 36.51 ± 7.26 years, with the 30–40-year (33.33%) and 40–50-year (32.38%) groups being most frequent, whereas Khosruzzaman et al.[11] reported a mean age of 41.51 ± 15.46 years, closely comparable to the present study, with the 36–45-year group (30.3%) predominating. The differences in age distribution may reflect variations in sample size, population characteristics, healthcare-seeking patterns, and study settings. A slight female predominance was observed in the present study, with females accounting for 53.0% compared with 47.0% males. This finding is consistent with Nessa et al.[10], who reported a more marked female predominance (72.38% vs. 27.62%), although Khosruzzaman et al.[11] observed an equal sex distribution. These findings suggest that dyspepsia affects both sexes substantially, with the degree of female predominance varying across populations.

Regarding clinical presentation, upper abdominal pain was the predominant symptom in the present study, reported by 55.7% of participants, followed by nausea (33.3%), while upper abdominal discomfort and heartburn were each reported by 19.0% and vomiting by 14.7%. The predominance of upper abdominal or epigastric pain is consistent with Al-Abachi et al.[12], who identified epigastric pain as the leading symptom among 372 dyspeptic patients (45.7%). Similarly, Agarwal et al.[13], in a North Indian cohort of 365 patients with upper gastrointestinal disorders/dyspepsia, reported abdominal or epigastric pain as the most frequent complaint, followed by bloating, nausea, gastric fullness, and belching. The relatively frequent occurrence of nausea in the present study is also comparable with the findings of Agarwal et al.[13], although the relative frequency of individual symptoms differed between the studies. In contrast, symptoms such as upper abdominal bloating (6.7%), early satiety (6.0%), water-brash (6.7%), and weight loss (0.3%) were less common in the present cohort. Likewise, Al-Abachi et

al.[12] reported relatively low frequencies of food regurgitation and weight loss, while Agarwal et al.[13] found early satiety and vomiting to be less frequent than the predominant pain and bloating symptoms. Overall, these findings reinforce the characteristic symptom heterogeneity of dyspepsia, while demonstrating that upper abdominal or epigastric pain remains the predominant presenting complaint across different populations.

Among relevant co-morbidities and risk factors, smoking was the most frequently reported exposure in the present study (10.0%), followed by spicy food consumption (7.3%), diabetes mellitus (6.0%), hypertension (3.0%), and NSAID use (1.7%). The frequency of smoking was lower than that reported by Rahman et al.[14], who found current or past smoking in 18.1% of participants with uninvestigated dyspepsia in an endoscopy-assisted household survey in Bangladesh, but both studies indicate that smoking is a relevant exposure among dyspeptic patients. NSAID use was uncommon in both studies, occurring in 1.7% of the present cohort compared with 1.3% in the study by Rahman et al.[14]; nevertheless, Rahman et al. demonstrated a strong independent association between NSAID use and uninvestigated dyspepsia (adjusted OR 7.05, 95% CI 2.11–23.55). Similarly, Nandurkar et al.[15] identified smoking and aspirin use as independent risk factors for dyspepsia, reporting ORs of 2.1 (95% CI 1.3–3.6) and 2.2 (95% CI 1.3–3.7), respectively. These findings support the clinical relevance of smoking and NSAID/aspirin exposure in dyspeptic populations, although the present study describes prevalence rather than demonstrating an independent association. The presence of diabetes and hypertension in a proportion of participants also reflects the occurrence of co-morbid chronic diseases among patients presenting for evaluation of dyspeptic symptoms. On physical examination, 99.3% of participants had no abnormal clinical signs, with an abdominal mass detected in only 0.7%, indicating that overt physical abnormalities were uncommon despite the presence of gastrointestinal symptoms.

Endoscopic evaluation demonstrated that normal endoscopy (NUD) was the most frequent finding, occurring in 56.3% of participants, whereas 43.7% had an identifiable endoscopic abnormality. Among the abnormal findings, gastritis/duodenitis (18.7%) and pre-pyloric erosion (17.0%) were predominant, followed by antral erosion (3.7%), congestive gastropathy (2.7%), and esophageal varices (2.7%). This pattern is consistent with the predominance of inflammatory and erosive lesions reported in previous studies, although the relative frequencies varied considerably. Shrestha et al.[16], in a large cohort of 2,141 patients undergoing endoscopy for dyspepsia, reported gastritis (41.66%) as the most common abnormality, followed by esophagitis, duodenal ulcer, and gastro-duodenitis, while 27.74% had normal endoscopic findings. Similarly, Andrabi et al.[17] reported normal or clinically insignificant findings in 73.1% of patients, with significant organic lesions present in 26.9%; among these, erosive gastroduodenitis (11.2%) was the most frequent abnormality, followed by esophagitis and peptic ulcer disease. Thus, despite differences in the proportion of normal examinations, the present study and previous reports consistently demonstrate that a substantial proportion of patients with dyspepsia have no major structural abnormality and that, when abnormalities are identified, inflammatory or erosive gastroduodenal lesions are among the predominant findings. Potentially serious lesions were uncommon in the present cohort, with gastric carcinoma and antral growth each accounting for 0.7%, while gastric polyp, GERD, and esophagitis were each detected in 0.3%. This relatively low frequency of malignancy is compatible with the generally low prevalence of serious organic pathology among unselected dyspeptic populations, although the clinical importance of identifying such lesions remains substantial.

The relationship between age and endoscopic abnormalities showed a numerical trend toward a greater proportion of abnormal findings with advancing age. Abnormal endoscopy was observed in 37.5% of participants aged ≤30 years, increasing to 39.4% among those aged 31–40 years, 47.5% among those aged 41–50 years, and 49.2% among those aged 51–60 years, before declining slightly to 42.5% in participants aged >60 years. However, the association was not statistically significant ($\chi^2 = 2.51$, $p = 0.642$). This pattern is consistent with the findings reported by Al-Abachi et al.[12], who observed a similar numerical tendency toward increasing endoscopic abnormality with age, particularly among patients aged ≥50 years, although the association was likewise not statistically significant. In contrast, Cheddie et al.[18], in a study of 1,000 consecutive endoscopies, demonstrated a statistically significant increase in clinically important endoscopic lesions with increasing age, with significant findings in 6.7% of patients aged <60 years compared with 17.1% of those aged ≥60 years ($p < 0.001$); similarly, significant pathology was found in 4.2% of patients aged <45 years versus 13.0% among those aged ≥45 years ($p < 0.001$). Although the present study did not demonstrate a statistically significant age-related association, its numerical pattern is compatible with the broader observation that organic endoscopic abnormalities may become more frequent with increasing age. The lack of statistical significance in the present cohort may be related to the relatively modest differences between age groups, sample size, and the overall distribution of endoscopic diagnoses. Importantly, the present findings should therefore be interpreted as a descriptive age-related trend rather than evidence of a statistically established association.

LIMITATIONS

The study had several limitations:

- The study was conducted at a single tertiary-level hospital with a relatively limited sample size, which may limit the generalizability of the findings to the wider population.
- The short study duration and observational design may have limited assessment of long-term clinical outcomes and causal relationships between risk factors and endoscopic findings.

CONCLUSION

Dyspepsia is a common gastrointestinal complaint with diverse clinical presentations and underlying endoscopic findings. In this study, it predominantly affected middle-aged individuals, with a slight female predominance, and upper abdominal pain was the most common presenting symptom. More than half of the patients had normal endoscopy, while the principal abnormal findings were gastritis/duodenitis and pre-pyloric erosion. Although abnormal endoscopic findings tended to increase with age, no statistically significant association was observed. Overall, the findings emphasize that most patients with dyspepsia have no major structural abnormality, while inflammatory and erosive gastroduodenal lesions represent the main organic endoscopic diagnoses.

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