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Original Article

A Study of Clinico-Endoscopic Correlation of Dyspepsia in a Tertiary-Level Hospital in Bangladesh

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ABSTRACT

Background: Dyspepsia is a common clinical condition with diverse upper gastrointestinal manifestations, and its symptoms may not reliably distinguish between functional and organic disease. Therefore, this study aimed to assess the clinical presentation of dyspepsia and determine its correlation with endoscopic findings among patients attending a tertiary-level hospital in Bangladesh. **Methods & Materials:** This hospital-based observational study was conducted at the Department of Medicine, Khawaia Yunus Medical Hospital, Sirajgonj, Bangladesh, from January to June 2023 among 300 patients aged ≥18 years with dyspepsia. Clinical assessment and upper gastrointestinal endoscopy were performed, and findings were categorized as normal/non-ulcer dyspepsia or abnormal. Data were analyzed using SPSS version 25.0; categorical and continuous variables were summarized appropriately, and $p<0.05$ was considered statistically significant. **Results:** Among 300 participants, the mean age was 40.0 ± 16.4 years, with females predominating (52.7%). Upper abdominal symptoms were the most common complaint (62.0%), followed by nausea (21.7%) and heartburn (21.3%). Endoscopy was normal/NUD in 44.3%, while gastritis/duodenitis (20.0%) and pre-pyloric erosion (16.3%) were the most common abnormalities. Upper abdominal symptoms, heartburn, anorexia, and nausea were significantly associated with endoscopic findings ($p<0.001$, $p<0.001$, $p<0.001$, and $p=0.002$, respectively). Age and gender were not significantly associated, whereas clinical signs showed a significant association ($p=0.023$). **Conclusion:** Dyspepsia has a heterogeneous clinical and endoscopic spectrum, with selected symptoms and clinical signs showing meaningful associations with endoscopic abnormalities, highlighting the importance of appropriate endoscopic evaluation.

Keywords: *Dyspepsia, Upper Gastrointestinal Endoscopy, Clinical Presentation, Endoscopic Findings, Functional Dyspepsia*

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INTRODUCTION

Dyspepsia is a frequently encountered medical condition in clinical practice, with a pooled prevalence of approximately 21%, although its prevalence may differ according to age, sex, geographical region, and the criteria used to define dyspepsia [1]. The overall global pooled prevalence of functional dyspepsia (FD) has been estimated at 8.4% [2]. Dyspepsia is generally characterized as a cluster of upper gastrointestinal symptoms. Barbara et al. described dyspepsia as an episodic or persistent abdominal symptom that is often associated with feeding and may result from an underlying organic cause or occur in the absence of an identifiable cause, in which case it is considered functional dyspepsia [3,4]. The condition encompasses a range of upper abdominal symptoms, including epigastric pain, burning sensation, postprandial fullness, early satiation, bloating, belching, and nausea [5].

Despite its frequent use in clinical practice, a robust and standardized clinical definition of dyspepsia has remained difficult to establish [5], and the term, along with its various qualifiers, has historically been interpreted differently by physicians and patients. Dyspepsia refers to difficult digestion or indigestion and may present with upper abdominal fullness, discomfort, early satiation, bloating, heartburn, belching, nausea, vomiting, or pain [6]. According to the National Institute for Health and Care Excellence (NICE), dyspepsia encompasses symptoms such as upper abdominal pain or discomfort, heartburn, gastric reflux, nausea, and vomiting. The reported prevalence of dyspepsia is also significantly higher among women, smokers, non-steroidal anti-inflammatory drug (NSAID) users, and H. pylori-positive individuals. Although some studies have suggested that careful assessment of symptoms may assist in distinguishing peptic ulcer from non-ulcer dyspepsia [7,8], other studies have demonstrated that most dyspeptic symptoms are unable to reliably differentiate between peptic ulcer and non-ulcer dyspepsia [9,10].

Upper esophagogastroduodenoscopy remains an important investigation in the evaluation of dyspepsia. Patients presenting with alarm features, including unexplained weight loss, recurrent vomiting, progressive dysphagia, odynophagia, gastrointestinal blood loss, or a family history of upper gastrointestinal cancer, are recommended to undergo upper endoscopic evaluation. [11] Endoscopic examination is also advised for patients with dyspepsia who reach the age of 50 years, develop alarm features such as unexplained weight loss, persistent swallowing difficulties, recurrent vomiting, visible gastrointestinal bleeding, anemia, fever, or a palpable abdominal mass, have a family history of gastric cancer, or fail to improve with initial management. Such evaluation is important for excluding upper gastrointestinal tumors and other serious organic conditions [12-14]. Nevertheless, several studies have demonstrated that most cases of dyspepsia are associated either with minor abnormalities of uncertain clinical significance or with a completely normal endoscopic examination, which may be classified as functional or non-ulcer dyspepsia, while only a smaller proportion are associated with PUD, reflux oesophagitis, or cancer [15].

Although functional or non-ulcer causes account for a substantial proportion of dyspepsia cases, clinically significant organic abnormalities may still be identified during endoscopic evaluation. An

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endoscopic study conducted in northern Norway found that among patients with epigastric pain, 9% had peptic ulcer disease (PUD) and 14% had oesophagitis. Similarly, Madeha et al. in Egypt reported abnormal endoscopic findings in 155 of 188 patients presenting with dyspepsia (86.1%), with gastritis being the most frequent histological finding, occurring in 68% of patients [16]. Although functional dyspepsia remains the predominant etiology, approximately 26.7% of patients with dyspepsia were reported to have an organic cause on endoscopic evaluation in the region [17]. Importantly, the ability of individual dyspeptic symptoms to distinguish between peptic ulcer and non-ulcer dyspepsia has not been consistent across studies [9]. In Bangladesh, two studies have reported a high prevalence of dyspepsia, with rates of 41.4% and 61.9% [18]. However, available evidence regarding the prevalence and clinical characteristics of dyspepsia in Bangladesh remains limited. One earlier study conducted in a rural Bangladeshi community reported a dyspepsia prevalence of 41.4% in 1987 [19]. These findings emphasize the importance of further evaluating the clinical presentation of dyspepsia and determining its relationship with endoscopic findings in patients attending a tertiary-care hospital in Bangladesh. Therefore, this study aimed to assess the clinical presentation of dyspepsia and determine its correlation with endoscopic findings among patients attending a tertiary-level hospital in Bangladesh.

Objective

- To assess the clinical presentation of dyspepsia and determine its correlation with endoscopic findings among patients attending a tertiary-level hospital in Bangladesh.

METHODS & MATERIALS

This hospital-based observational study was conducted at the Department of Medicine, Khawaia Yunus Medical Hospital, Sirajgonj, Bangladesh, from January 2023 to June 2023. A total of 300 patients presenting with dyspepsia were included based on predefined eligibility criteria. Data were collected to assess the clinical presentation of dyspepsia and determine its correlation with upper gastrointestinal endoscopic findings.

Inclusion Criteria

i. Patients aged ≥18 years presenting with dyspeptic symptoms.
ii. Patients with symptoms suggestive of dyspepsia, including upper abdominal discomfort or pain, nausea, heartburn, early satiety, vomiting, or related upper gastrointestinal symptoms.
iii. Patients referred for or willing to undergo upper gastrointestinal endoscopy.
iv. Patients who provided informed consent to participate in the study.

Exclusion Criteria

i. Patients with previously diagnosed upper gastrointestinal malignancy.
ii. Patients with previously established peptic ulcer disease or other known structural upper gastrointestinal disease.
iii. Patients with a history of previous upper gastrointestinal surgery.
iv. Patients unable or unwilling to undergo upper gastrointestinal endoscopy.
v. Patients who did not provide informed consent or had incomplete clinical or endoscopic data.

Clinical Assessment and Data Collection

Patients were evaluated through a detailed history and physical examination. Demographic characteristics, dyspeptic symptoms, and relevant clinical signs were recorded. The dyspeptic symptoms assessed included upper abdominal symptoms, nausea, heartburn, anorexia, vomiting, early satiety, water-brash, soreness, hematemesis, weight loss, bitterness, and weakness.

Upper Gastrointestinal Endoscopy

All enrolled patients underwent upper gastrointestinal endoscopy. Endoscopic findings were documented and categorized as normal or abnormal. Abnormal findings included gastritis/duodenitis, erosions, growths, gastroesophageal reflux disease, esophageal varices, congestive gastropathy, polyps, peptic ulcer disease, and gastrointestinal malignancies. Patients with no significant endoscopic abnormality were categorized as having non-ulcer dyspepsia (NUD), whereas those with any documented pathological lesion were categorized as having abnormal endoscopic findings.

Statistical Analysis

Data were entered, processed, and analyzed using the Statistical Package for the Social Sciences (SPSS), version 25.0. Categorical variables were expressed as frequency and percentage, while continuous variables were summarized as mean ± standard deviation. Associations between categorical variables were assessed using the chi-square test or Fisher's exact test, as appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS

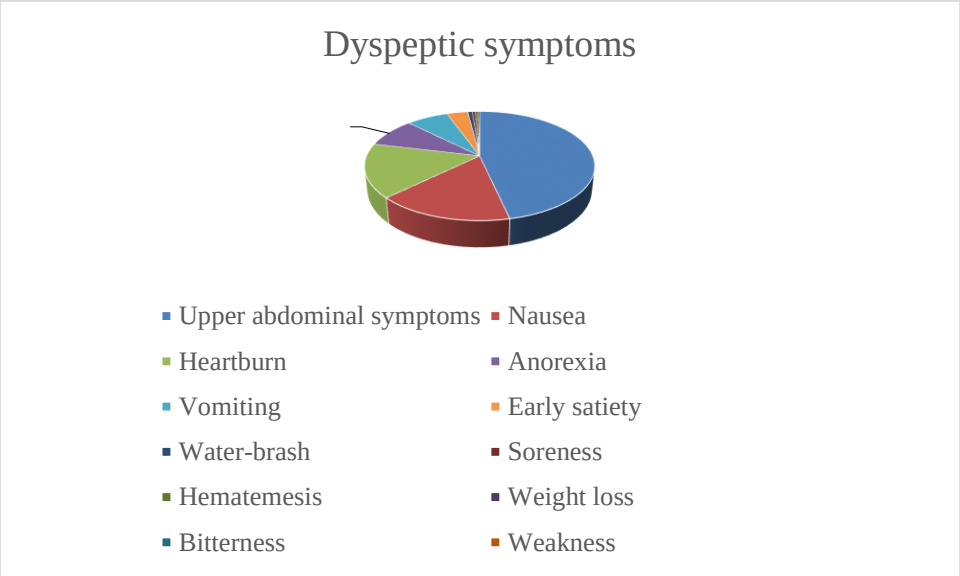
The participants had a mean age of 40.0 ± 16.4 years. The largest proportion belonged to the 41–50-year age group (78 patients, 26.0%), followed by those aged 31–40 years (70 patients, 23.3%) and ≤30 years (69 patients, 23.0%). Participants aged 51–60 years and >60 years accounted for 48 (16.0%) and 35 (11.7%) patients, respectively. Female patients predominated, comprising 158 (52.7%) participants, while 142 (47.3%) were male.

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

Variable		Frequency (n)	Percentage (%)
Age group (years)	≤30	69	23.0
	31–40	70	23.3
	41–50	78	26.0
	51–60	48	16.0
	>60	35	11.7
	Mean ± SD (years)	40.0 ± 16.4	
Gender	Male	142	47.3
	Female	158	52.7
	Total	300	100.0

Table II
Distribution of Dyspeptic Symptoms Among the Study Participants (*n* = 300).

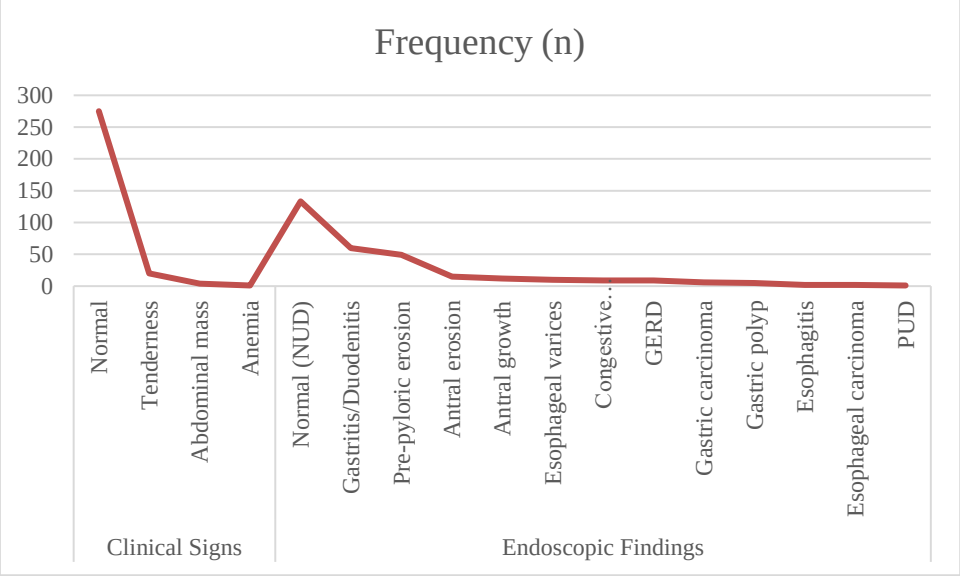
Dyspeptic symptom	Frequency (n)	Percentage (%)
Upper abdominal symptoms	186	62.0
Nausea	65	21.7
Heartburn	64	21.3
Anorexia	35	11.7
Vomiting	28	9.3
Early satiety	14	4.7
Water-brash	3	1.0
Soreness	2	0.7
Hematemesis	2	0.7
Weight loss	1	0.3
Bitterness	0	0.0
Weakness	0	0.0



Upper abdominal symptoms were the most frequently reported dyspeptic presentation, occurring in 186 patients (62.0%). Nausea was reported in 65 patients (21.7%), followed by heartburn in 64 (21.3%) and anorexia in 35 (11.7%). Vomiting was present in 28 patients (9.3%), while early satiety was reported in 14 (4.7%). Water-brash, soreness, and hematemesis were reported in 3 (1.0%), 2 (0.7%), and 2 (0.7%) patients, respectively. Weight loss was reported in only 1 patient (0.3%), while no patients reported bitterness or weakness. Multiple symptoms could be reported by individual patients.

Table III
Clinical Signs and Endoscopic Findings Among the Study Participants (*n* = 300).

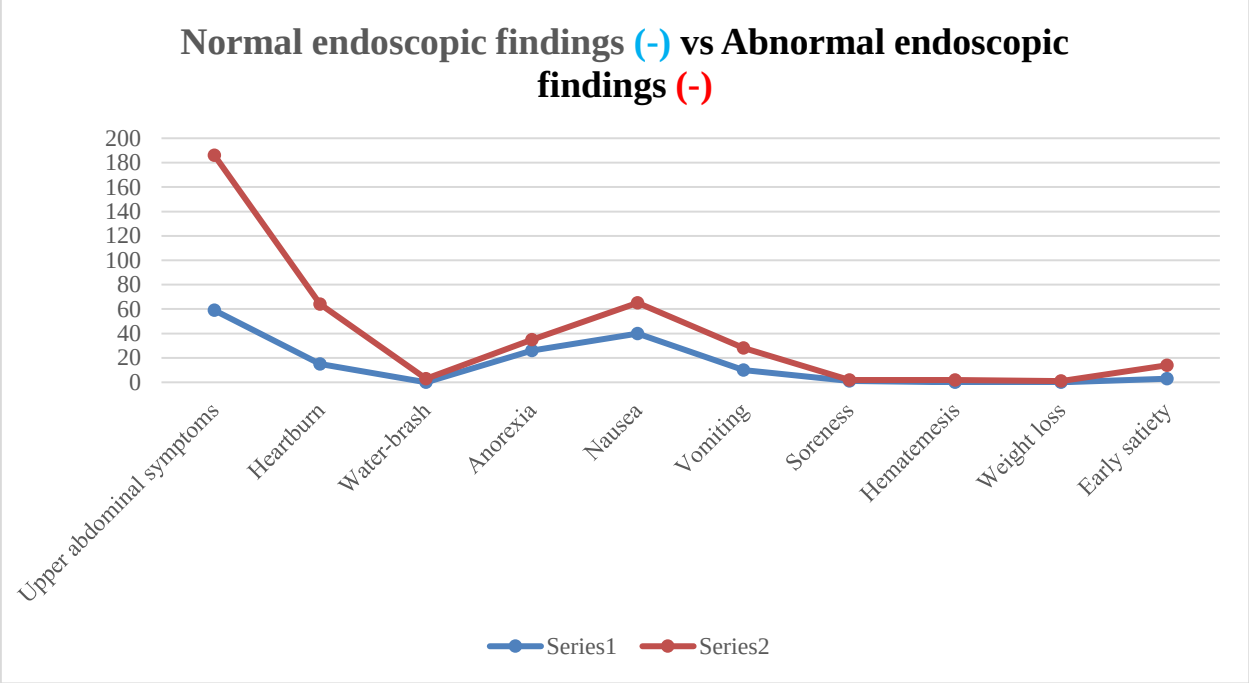
Variable		Frequency (n)	Percentage (%)
Clinical Signs	Normal	275	91.7
	Tenderness	20	6.7
	Abdominal mass	4	1.3
	Anemia	1	0.3
Endoscopic Findings	Normal (NUD)	133	44.3
	Gastritis/Duodenitis	60	20.0
	Pre-pyloric erosion	49	16.3
	Antral erosion	15	5.0
	Antral growth	12	4.0
	Esophageal varices	10	3.3
	Congestive gastropathy	9	3.0
	GERD	9	3.0
	Gastric carcinoma	6	2.0
	Gastric polyp	5	1.7
	Esophagitis	2	0.7
	Esophageal carcinoma	2	0.7
	PUD	1	0.3



The majority of patients had no abnormal clinical signs (275 patients, 91.7%). Tenderness was observed in 20 patients (6.7%), while abdominal mass and anemia were documented in 4 (1.3%) and 1 (0.3%) patient, respectively. On endoscopic examination, normal findings (NUD) were observed in 133 patients (44.3%), whereas gastritis/duodenitis was the most common abnormal finding, occurring in 60 patients (20.0%), followed by pre-pyloric erosion in 49 (16.3%) and antral erosion in 15 (5.0%). Antral growth was found in 12 patients (4.0%), while esophageal varices and congestive gastropathy were observed in 10 (3.3%) and 9 (3.0%) patients, respectively. GERD was identified in 9 patients (3.0%), gastric carcinoma in 6 (2.0%), gastric polyp in 5 (1.7%), and esophagitis and esophageal carcinoma in 2 (0.7%) patients each. PUD was observed in 1 patient (0.3%).

Table IV
Association Between Dyspeptic Symptoms and Endoscopic Findings (*n* = 300).

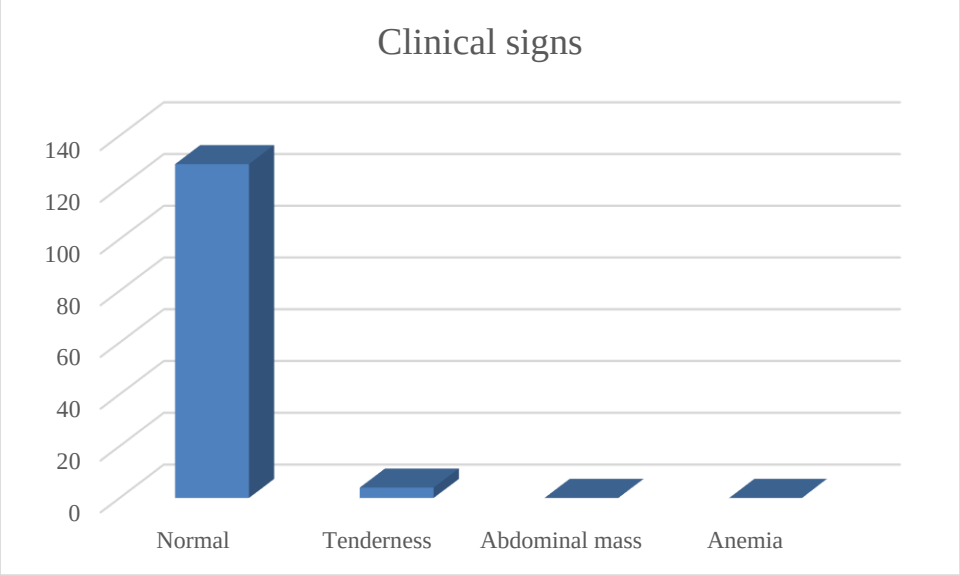
Dyspeptic symptom	Normal endoscopy, n (%)	Abnormal endoscopy, n (%)	p-value
Upper abdominal symptoms	59 (31.7)	127 (68.3)	<0.001
Heartburn	15 (23.4)	49 (76.6)	<0.001
Water-brash	0 (0.0)	3 (100.0)	0.257
Anorexia	26 (74.3)	9 (25.7)	<0.001
Nausea	40 (61.5)	25 (38.5)	0.002
Vomiting	10 (35.7)	18 (64.3)	0.335
Soreness	1 (50.0)	1 (50.0)	1.000
Hematemesis	0 (0.0)	2 (100.0)	0.505
Weight loss	0 (0.0)	1 (100.0)	1.000
Early satiety	3 (21.4)	11 (78.6)	0.077



Upper abdominal symptoms and heartburn showed statistically significant associations with endoscopic abnormalities ($p < 0.001$ for both). Among patients with upper abdominal symptoms, 127 (68.3%) had abnormal endoscopic findings compared with 59 (31.7%) with normal endoscopy. Similarly, abnormal endoscopic findings were observed in 49 (76.6%) patients with heartburn compared with 15 (23.4%) with normal endoscopy. Anorexia and nausea were also significantly associated with endoscopic status ($p < 0.001$ and $p = 0.002$, respectively). No statistically significant association was observed between vomiting ($p = 0.335$), water-brash ($p = 0.257$), soreness ($p = 1.000$), hematemesis ($p = 0.505$), weight loss ($p = 1.000$), or early satiety ($p = 0.077$) and endoscopic findings.

Table V
Association of Demographic and Clinical Characteristics With Endoscopic Findings ($n = 300$).

Clinical characteristic		Normal endoscopy, n (%)	Abnormal endoscopy, n (%)	p-value
Age group (years)	≤30	32 (46.4)	37 (53.6)	0.491
	31–40	35 (50.0)	35 (50.0)	
	41–50	34 (43.6)	44 (56.4)	
	51–60	21 (43.8)	27 (56.3)	
	>60	11 (31.4)	24 (68.6)	
Gender	Male	61 (43.0)	81 (57.0)	0.649
	Female	72 (45.6)	86 (54.4)	
Clinical signs	Normal	129 (46.9)	146 (53.1)	0.023
	Tenderness	4 (20.0)	16 (80.0)	
	Abdominal mass	0 (0.0)	4 (100.0)	
	Anemia	0 (0.0)	1 (100.0)	



There was no statistically significant association between age group and endoscopic findings (p = 0.491). The proportion of abnormal endoscopic findings was highest among patients aged >60 years (24 patients, 68.6%) and lowest among those aged 31–40 years (35 patients, 50.0%). Similarly, gender was not significantly associated with endoscopic findings (p = 0.649); abnormal endoscopy was observed in 81 male patients (57.0%) and 86 female patients (54.4%). Clinical signs showed a statistically significant association with endoscopic findings (p = 0.023). Abnormal endoscopic findings were observed in 16 patients (80.0%) with tenderness, all 4 patients (100.0%) with an abdominal mass, and the single patient (100.0%) with anemia, compared with 146 (53.1%) patients with normal clinical signs.

DISCUSSION

In this hospital-based observational study conducted at the Department of Medicine, Khawaia Yunus Medical Hospital, Sirajgonj, Bangladesh, a substantial proportion of patients presenting with dyspepsia had abnormal upper gastrointestinal endoscopic findings. Upper abdominal symptoms were the most common clinical presentation, followed by nausea and heartburn, while gastritis/duodenitis and pre-pyloric erosion were the predominant endoscopic abnormalities. Significant associations were observed between endoscopic findings and upper abdominal symptoms, heartburn, anorexia, nausea, and clinical signs, whereas age and gender were not significantly associated with endoscopic abnormalities. These findings highlight the variable clinical presentation of dyspepsia and the importance of evaluating its clinico-endoscopic relationship in patients presenting to tertiary-level hospitals.

In the present study, the mean age of the participants was 40.0 ± 16.4 years, with the largest proportion belonging to the 41–50-year age group (26.0%), followed by those aged 31–40 years (23.3%) and ≤30 years (23.0%). This distribution is broadly comparable with the findings of Tanni et al.[20], who reported a mean age of 42.33 ± 14.30 years and observed the highest proportion of patients in the 41–50-year age group (27.27%). Similarly, Chowdhury et al.[21] reported a mean age of 42.24 ± 15.45 years, which was close to that observed in the present study. Females constituted a slight majority in the present study (52.7%), whereas males accounted for 47.3%. In comparison, Tanni et al.[20] and Chowdhury et al.[21] reported relatively balanced sex distributions, with males comprising 50.35% and 50.5% of their respective study populations. The similarity in mean age and the concentration of participants within the middle-aged groups across these studies suggests that dyspepsia is frequently encountered during the fourth and fifth decades of life. The slight female predominance observed in the present study may, however, reflect differences in the demographic characteristics and healthcare-seeking patterns of the study populations.

The clinical presentation in the present study demonstrated considerable heterogeneity, with upper abdominal symptoms being the most frequently reported complaint (62.0%), followed by nausea (21.7%) and heartburn (21.3%). Anorexia (11.7%) and vomiting (9.3%) were less frequent, while early satiety and other symptoms such as water-brash, soreness, hematemesis, and weight loss were relatively uncommon. These findings are broadly comparable with those reported by Perveen et al.[22], who identified upper abdominal pain, heartburn, early satiation, and vomiting among the principal upper gastrointestinal symptoms in the general population, although the frequencies differed from those observed in the present study. Chowdhury et al.[18] similarly described dyspepsia as a heterogeneous symptom complex involving epigastric pain, postprandial fullness, bloating, early satiety, belching, nausea, vomiting, heartburn, acid regurgitation, and anorexia. The predominance of upper abdominal symptoms, nausea, and heartburn in the present study therefore supports the recognized variability in the clinical manifestations of dyspepsia. Differences in symptom frequency between studies may be related to variations in study populations, symptom definitions, methods of symptom assessment, and clinical settings.

Regarding endoscopic findings, normal endoscopy consistent with non-ulcer dyspepsia was observed in 44.3% of participants, indicating that a substantial proportion of patients had no significant structural abnormality despite presenting with dyspeptic symptoms. Among the abnormal findings, gastritis/duodenitis was the most common (20.0%), followed by pre-pyloric erosion (16.3%) and antral erosion (5.0%). Other abnormalities included antral growth, esophageal varices, congestive gastropathy, GERD, gastric carcinoma, gastric polyps, esophagitis, esophageal carcinoma, and PUD. These findings are comparable in pattern with those reported by Al-Abachi et al.[23], who found gastroduodenitis to be the predominant endoscopic abnormality, followed by esophagitis and peptic ulcer disease. Badi et al.[24] also reported gastritis as the most frequent endoscopic finding among patients with uninvestigated dyspepsia, although the frequencies of individual lesions differed considerably from those in the present study. The relatively high proportion of normal endoscopic examinations in the present study is consistent with the recognized predominance of functional or non-ulcer dyspepsia among patients presenting with dyspeptic symptoms. At the same time, the identification of erosive lesions, growths, and malignancies

demonstrates that clinically important organic pathology may also occur in this population. Differences in the prevalence of specific endoscopic lesions across studies may be attributable to differences in patient selection, referral patterns, age distribution, local disease prevalence, and endoscopic diagnostic practices.

The present study further demonstrated that several dyspeptic symptoms were significantly associated with endoscopic findings. Upper abdominal symptoms were significantly more common among patients with abnormal endoscopy than among those with normal endoscopy (68.3% vs. 31.7%, $p<0.001$), and heartburn was similarly associated with abnormal findings (76.6% vs. 23.4%, $p<0.001$). Anorexia and nausea also showed statistically significant associations with endoscopic status, although these symptoms were more frequently observed among participants with normal endoscopy. In contrast, vomiting, early satiety, water-brash, soreness, hematemesis, and weight loss did not show statistically significant associations with endoscopic abnormalities. These findings are partly consistent with Serra et al.[25], who reported that individual upper gastrointestinal symptoms did not show a consistent overall relationship with abnormal endoscopic findings. Similarly, Odeghe et al.[26] identified epigastric pain or burning as a common presentation among patients with dyspepsia and found that certain alarm features were more suggestive of significant endoscopic pathology. In the present study, hematemesis was observed exclusively among patients with abnormal endoscopy, although the association did not reach statistical significance, possibly because of the small number of patients presenting with this symptom. Overall, these findings indicate that although some symptoms, particularly upper abdominal symptoms and heartburn, may be associated with abnormal endoscopic findings, individual dyspeptic symptoms do not consistently predict the presence or absence of structural abnormalities.

With regard to demographic characteristics, the proportion of abnormal endoscopic findings increased from 53.6% among participants aged ≤30 years to 68.6% among those aged >60 years; however, this trend did not reach statistical significance ($p=0.491$). Similarly, abnormal endoscopic findings were observed in 57.0% of males and 54.4% of females, with no significant association between gender and endoscopic findings ($p=0.649$). These findings are consistent with the observations of Wallace et al.[27], who reported that age and alarm symptoms had limited ability to predict significant endoscopic pathology among patients with dyspepsia. Jung et al.[28], however, reported a significant association between male sex and endoscopic abnormalities, indicating that demographic predictors may vary between populations. In the present study, clinical signs showed a statistically significant association with endoscopic findings ($p=0.023$). Abnormal endoscopy was present in 80.0% of patients with tenderness and in all patients with an abdominal mass or anemia. Although the numbers of patients with abdominal mass and anemia were very small, these findings are clinically relevant because such objective abnormalities may indicate underlying organic pathology. Thus, while demographic characteristics alone did not significantly predict endoscopic abnormalities in the present study, abnormal clinical signs appeared to have greater relevance in identifying patients with potentially significant endoscopic lesions.

LIMITATIONS

The study had a few limitations:

- The study was conducted at a single tertiary-level hospital, which may limit the generalizability of the findings to the wider population.
- The study included a relatively limited sample size, which may have reduced the ability to detect associations for less frequent symptoms and endoscopic findings.

CONCLUSION

Dyspepsia is a common upper gastrointestinal symptom complex with diverse clinical presentations and may reflect either functional symptoms or underlying organic pathology. The present study demonstrated that upper abdominal symptoms predominated, while gastritis/duodenitis was the most frequent endoscopic abnormality. Significant associations were observed between selected dyspeptic symptoms and endoscopic findings, whereas demographic characteristics showed no significant association. Overall, the findings highlight the heterogeneous nature of dyspepsia and support the role of appropriate endoscopic evaluation in identifying underlying organic lesions.

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