

Endoscopic findings in patients with uninvestigated dyspepsia: A retrospective study from Qatar

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Abstract

Background/Aim:

Dyspepsia is a common complaint in general clinical practice. The prevalence of clinically significant findings in endoscopy in dyspeptic subjects of various age groups and ethnicities in Qatar is not well studied. This study aimed to evaluate the prevalence of endoscopic findings in previously uninvestigated patients with dyspepsia.

Methods

we retrospectively studied subjects older than 18 years of age who underwent endoscopy for dyspeptic complaints from January 2011 to December 2017. Subjects who already had peptic ulcer disease, who underwent endoscopy for reasons other than dyspepsia and those with incomplete data were excluded.

Results

A total of 824 subjects were reviewed for eligibility and 733 were included for analysis. The mean \pm SD age of the study subjects was 42.7 ± 13.5 years and 59.5% were males. Epigastric pain was the predominant symptom (79.2%) followed by heartburn (26.1%). Abnormal endoscopic findings were noted in 91.8% of subjects. Gastritis (65.5%) and esophagitis (33.1%) were the most common findings observed. The overall prevalence of gastric ulcer was 4.6% and it was higher in the subjects above 60 years of age (14.1%, $p = 0.001$). Gastric carcinoma was seen only in 4 (0.54%) subjects.

Conclusion

Gastritis was the most common endoscopic finding observed followed by esophagitis. The most common presenting symptoms were epigastric pain and heartburn. The prevalence of gastric ulcer was significantly high in patients above 60 years and gastric carcinoma was low in the study population.

Background

Dyspepsia is a common, but a non specific complaint in adults seeking medical consultation. In primary care setting dyspepsia accounts for 2–5% of all consultation in adults¹ and up to 40% of the general population reports these symptoms [2, 3]. The exact prevalence of dyspepsia is not known and it varies with gender and country of origin. The National institute for health care and Excellence (NICE) guidelines describe dyspepsia as range of symptoms which include upper abdominal pain or discomfort, heartburn, gastric reflux, nausea or vomiting [4]. The Rome IV criteria define dyspepsia as any combination of 4 symptoms: postprandial fullness, early satiety, epigastric pain, and epigastric burning that are severe enough to interfere with the usual activities and occur at least 3 days per week over the last 3 months

with an onset of at least 6 months in advance [5]. Several diseases present with above symptoms which includes peptic ulcer disease (PUD), inflammatory bowel disease (IBD) and malignancy. In addition dyspeptic symptoms also may result from variety of other conditions such as pancreatitis, biliary tract disease and acute coronary syndrome.

Dyspepsia is not only a common symptom, but may be also a marker of an underlying structural disease. Malignancy is present in 1–3% of patients with dyspepsia and PUD is seen 5–15% of patients [6–8]. Given the wide range of presentation, it is a tendency in clinicians to treat empirically with acid suppression therapy in early stages especially in younger age groups. The role of barium studies in evaluating patients with dyspepsia has low sensitivity and specificity compared with upper gastrointestinal endoscopy (endoscopy) and it does not allow to obtain biopsy specimen. Therefore utility of barium study should be generally limited to patients who are at high risk for endoscopy. Although many guidelines have been published on dyspepsia, much controversy still exists regarding the most appropriate management strategy. The past medical guidelines on indication for early endoscopy in patients with dyspepsia were based on age and alarm features. The guidelines recommended for an early endoscopy in patients with alarm features regardless of the age and for patients with new onset dyspepsia after 45–55 years of age. While in younger patients without alarm features either empirical proton pump inhibitors (PPI) or *Helicobacter pylori* (*H pylori*) test and treat were the initial treatment strategies [6, 9–14]. Despite of having multiple guidelines on the role of endoscopy in dyspepsia, several studies have shown that alarm features have limited predictive value for an underlying malignancy [8, 15–17]. The updated 2017 American College of Gastroenterology (ACG) and the Canadian Association of Gastroenterology (CAG) guideline recommend that patients ≥ 60 years of age presenting with dyspepsia are investigated with endoscopy to exclude organic pathology where as patients at higher risk of malignancy such as spending their childhood in a high risk gastric cancer country or having a positive family history could be offered an endoscopy at a younger age [18]. Alarm features should not automatically precipitate endoscopy in younger patients but this should be considered on a case-by-case basis [18].

The aim of the present study was to evaluate the prevalence of abnormal endoscopic findings in previously uninvestigated patients with dyspepsia who underwent endoscopy and to study the distribution of these abnormal findings among various age groups and nationalities.

Methods And Subjects

Study design and study subjects

A cross sectional retrospective study was conducted at AlKhor Hospital, Hamad Medical Corporation, Qatar. All subjects older than 18 years of age who underwent endoscopy for dyspeptic complaints from January 2011 and December 2017 were included in the study. Dyspepsia was defined according to NICE guidelines, which describes dyspepsia as range of symptoms that include upper abdominal pain or discomfort, heartburn, gastric reflux, nausea or vomiting [4]. In those subjects who had more than one

endoscopy during the study period the first endoscopy was taken as index endoscopy. Subjects who already had peptic ulcer disease, who underwent endoscopy for reasons other than dyspepsia and those with incomplete data were excluded.

Data collection

Data were retrieved from the medical records file and electronic data base using the health care number. This included basic demographics, comorbid conditions, symptoms and signs, smoking, alcohol intake, and medication use. The endoscopic data included site and type of abnormality, biopsy results (if available) and results of CLO test (Rapid Urease test) for *H. pylori*.

Statistical analysis

Descriptive statistics were used to describe the data. For continuous variables, the mean and standard deviation (SD) were used to summarize the data. For categorical variables, frequencies and percentages were reported. The differences between groups were analyzed using Pearson's chi-squared test or Fisher's exact test. A *p*-value of < 0.05 was considered statistically significant. The data were processed and analyzed using SPSS Statistics (SPSS Statistics Inc., Chicago, US, version 22).

Results

Demographic characteristics

A total of 824 subjects were enrolled, of which 91 were excluded (i.e., 53 subjects had incomplete information, 15 had repeat endoscopy, 23 had endoscopy for causes other than dyspepsia) leaving a final cohort of 733 for analysis. The mean age (\pm SD) of the study subjects was 42.71 ± 13.5 years and 59.5% were males. Diabetes (14.9%) and hypertension (13.1%) were the most common co-morbid conditions observed. A total of 49 subjects were smokers and 23 were consuming alcohol. Data on smoking and alcohol were not available on 299 and 308 subjects, respectively. Epigastric pain was the predominant symptom (79.%) followed by heartburn (26.1%) in the overall cohort. Baseline demographic features and presenting symptoms at the time of endoscopy are shown in Table 1.

Table 1
Distribution of demographic and clinical features according to the various age groups

Characteristics	Age (year) (N = 733)			P-value
	< 40 (N = 327) N (%)	40–59 (N = 335) N (%)	≥ 60 (N = 71) N (%)	
Gender:	196 (59.9)	199 (59.4)	41(57.7)	0.943
- Male (N = 437)	131 (40.1)	136 (40.6)	30 (42.3)	0.0001
- Female (N = 296)	111 (33.9)	126 (37.7)	10 (14.1)	0.001
Nationality:	94 (28.7)	79 (23.4)4.0	23 (32.4)	0.001
- Asia (N = 247)	58(17.7)	76(22.8)	14(19.7)	0.401
- Qatar (N = 196)	61(18.7)	44(13.2)	23(32.4)	0.001
- Africa (N = 148)	3(0.9)	10(3.0)	1(1.4)	0.003
- Middle East (N = 128)	9 (2.8)	54 (16.2)	39 (54.9)	0.012
- Others (N = 14)	7 (2.1)	49 (14.7)	40 (56.3)	0.120
Co-morbidities:	7 (2.1)	12 (3.6)	1 (1.4)1	0.34
- Hypertension (N = 102)	1(0.3)	7(2.1)	11 (15.5)	0.148
- Diabetes mellitus (N = 96)	1 (0.3)	6 (1.8)	4 (5.6)	0.760
- Bronchial asthma (N = 401)	3 (0.9)	16 (4.8)	3 (4.2)	0.769
- Coronary artery disease (N = 19)	266 (81.3)	264 (79)	50 (70.4)	0.273
- Chronic kidney disease (N = 11)	37 (11.3)1	19 (5.7)	6 (8.5)	0.288
- Chronic liver disease (N = 22)	43 (13.1)	29 (8.7)	6(8.5)	0.155
Presenting symptoms	32 (9.8)	29 (8.7)	8 (11.3)	
- Epigastric pain (N = 580)	86 (26.3)	89 (26.6)	16 (22.5)	
- Belching (N = 62)	12 (3.7)	6 (1.8)	3 (4.2)	
- Nausea (N = 78)	20 (6.1)	22 (6.6)	8 (11.3)	

Characteristics	Age (year) (N = 733)			P-value
	< 40 (N = 327) N (%)	40–59 (N = 335) N (%)	≥ 60 (N = 71) N (%)	
- Vomiting (N = 69)				
- Heartburn (N = 191)				
- Early satiety (N = 21)				
- Melena (N = 50)				
- Diarrhea (N = 60)				

Prevalence of positive findings on endoscopy

Clinically significant endoscopic findings were found in 91.8% of study subjects. The proportion of subjects with significant findings in oesophagus, stomach and duodenum were 73.5%, 33.3%, and 14%, respectively. On sub analyzing, oesophagitis was by far the most common esophageal abnormality (33.1%) observed. Gastritis was found to be the most common abnormality in stomach (65.5%) and, duodenitis was the most common endoscopic duodenal finding (11.7%). Gastric and duodenal ulcer was seen in 4.6% and 5.9% subjects, respectively. Gastric carcinoma was seen only in 4 (0.54%) patients (Table 2). The CLO test for *H. pylori* infection was positive in 35.6% of the study subjects.

Table 2
Distribution of endoscopic findings according to the various age groups

Endoscopic findings	Age (year) (N = 733)			P-value
	< 40 (N = 327) N (%)	40–59 (N = 335) N (%)	≥ 60 (N = 71) N (%)	
Esophagus:	110 (33.6)	115 (34.3)	18 (25.35)	0.652
- Esophagitis (N = 243)	3 (0.9)	11 (3.3)	4 (5.6)	0.027
- Esophageal Varices (N = 18)	6(1.8)	4(1.2)	1(1.4)	0.975
- Hiatus hernia (N = 11)	10 (3.1)	14 (4.2)	10 (14.1)	0.001
Stomach:	0	2 (0.6)	2 (2.8)	0.014
- Gastritis (N = 481)	0	3 (0.9)	1 (1.4)	0.171
- Gastric ulcer (N = 34)	38 (11.6)	41 (12.3)	7 (9.9)	0.844
- Fundal Varices (N = 4)	16 (4.9)	24 (7.2)	3 (4.2)	0.376
- Gastric cancer (N = 4)	27 (8.3)	26 (7.8)	7 (8.9)	0.563
Duodenum:				
- Erosive duodenitis (N = 86)				
- Duodenal ulcer (N = 43)				
Normal endoscopy (N = 60)				

** Percentage does not add to 100% because each subject may have more than one endoscopic finding.

Presenting symptoms and endoscopic findings according to age groups

For analytical purpose the subjects were categorized into three groups according to the age, that is; less than 40 years, 40 to 59 years and ≥ 60 years. Analysis of subgroups revealed that the least number of

subjects were in more than 60 years group (9.8%), however gender distribution across all the three groups were similar (0.943). Similar to the results in the overall cohort, epigastric pain and heartburn were the predominant symptoms across the three age groups. Melena was more common in older age group (Table 1).

The total prevalence of clinically significant findings on endoscopy was similar in all the 3 age groups. On analyzing overall disease specific pattern of involvement in each age group a similar pattern of abnormality was seen, that is gastritis was the most common finding followed by oesophagitis. The prevalence of site specific findings were also similar in all the three age groups with stomach by far being the most commonly involved site (69.4%; 76.3%; 78.95%; in less than 40 years, 40–59 years, ≥ 60 years, respectively, $p = 0.073$), while duodenum being the least involved (14.1%; 14.7%; 11.3%; $p = 0.755$) (Table 2).

Oesophagus

In oesophagus, oesophagitis was the most common finding seen across all the three age groups (33.6%, 34.32%, 25.35%, $p = 0.652$). There was no statistically significant difference in the prevalence of various endoscopic esophageal findings between the groups.

Stomach

A high prevalence of gastritis was observed in all the three groups (61.7, 69.1%, and 67.6%) but the difference among them was not statistically significant ($p = 0.233$). The prevalence of gastric ulcer was significantly higher in subjects above 60 years. Only 4 subjects had gastric carcinoma of which 3 were in 40–59 years age group.

Duodenum

Erosive duodenitis was the most common duodenal finding noted in all the groups. Duodenal ulcer was more common in the 40–59 years age (7.2%) when compared to other two age groups which was statistically not significant ($p = 0.376$).

Endoscopic findings according to ethnicity

When the endoscopic findings were compared across various ethnic groups, there was no statistically significant difference among them (Table 3).

Table 3
Distribution of abnormal endoscopic findings in ethnic groups according to age groups

	Qatar (N = 196)	Asia (N = 247)	Middle East (N = 128)	Africa (N = 148)	Other (N = 14)	P-value
Abnormal	179 (91.3)	226 (91.5)	118 (92.2)	137 (92.6)	12 (85.7)	0.795
Below 40 years	86/94 (91.5)	102/ 111 (91.9)	55/61 (90.2)	55/ 58 (94.8)	2/3 (66.6)	0.032
40–59 years	72/79 (92.3)	115/126 (91.3)	41/44 (93.2)	71/76 (93.4)	9 /10 (90)	0.978
≥ 60 Years	21/23 (91.3)	9/10 (90)	22/23 (95.7)	11/14 (78.6)	1/1 (100)	0.551

Discussion

The results of this study show a high prevalence of significant endoscopic findings in subjects with dyspepsia. Significant endoscopic findings were observed in 91.8% of study subjects which is higher than the previously reported rates [15, 19–23]. A study done by Thomson et al reported that 58% of patients having significant findings on endoscopy [24]. The higher prevalence rate in our study carries more significance than the study done by Thomson et al due to the fact that they excluded patients with acid suppression therapy or prokinetic therapy 2–4 weeks prior to the study. Another study done on dyspeptic patients unresponsive to PPIs undergoing endoscopy found abnormal findings in around 67% of patients. They included only patients between the ages of 18 to 45 years [22].

We observed that epigastric pain was the most common presenting symptom (79.2%) in the overall study population, which is consistent with the findings of previous study by Khaled et al who reported it as 76.6% [20], while it was reported as 34% in another study [24]. Our study revealed a higher prevalence of gastritis than other diseases (65.5%) which is higher than the past reported rates [20, 22, 24].

The overall prevalence of malignancy was found to be low in the present study subjects (0.54%) and all of them were above 40 years of age. This is in partial agreement with the results of past study done by Thomson et al where they found malignancy only in 2 patients and both were above 50 years of age [24]. Similarly other studies also reported a low prevalence of malignancy 0.8% [20]. In our study the prevalence rates of gastric and duodenal ulcer were found to be 4.6 and 5.9 respectively. The previous studies reported similar rates for gastric ulcer while the prevalence of duodenal ulcer showed a conflicting results [20, 22]. Mestan et al reported prevalence of gastric ulcer as 3.6% and that of duodenal ulcer 8.1% where as in another study it was found to be 2.6% and 1.7% respectively [20, 22].

We also examined the presence of significant endoscopic findings among different nationalities and it was found to be high in all the ethnic groups, but the difference among them was not statistically significant. On sub analysis of subjects of various ethnicities according to age groups a similar pattern of

involvement was observed. Since state of Qatar has large number of expatriate population from across the globe this observation carries significance. A previous study from Qatar showed that 80% of study population had abnormal endoscopic findings. Their study population included two groups that is Qatari nationals with a mean age of 37 years and expatriates with a mean age of 38 years. They did not find any significant difference in endoscopic findings between the two groups [25].

There are few other studies done in the Middle East region on the prevalence of PUD in the past. Two studies from Saudi Arabia reported a prevalence of 21.9% and 21.2% respectively. The first study which had a study population mainly between 18–25 years showed high prevalence of gastric ulcer 16.2% and duodenal ulcer of 5.6%. They found that PUD was more common in younger age group of 18–45 years when compared to above 45 years age [26]. Another study done in elderly population in Saudi Arabia showed a PUD prevalence of 21.2% [27], and more common in females [22]. A study in Iran reported lower prevalence of PUD (8.2%) with gastric ulcer of 3.2% and duodenal ulcer of 4.9% [28].

Studies in other parts of Asia showed higher prevalence of PUD than European population. A report from China [29] reported a prevalence of 17.2% (gastric ulcer 6.1% versus 13.3% for duodenal ulcer) where as studies in Europe showed a lower prevalence between 4.1–6.2% [30, 31] The higher prevalence in China could be due to high prevalence of *H. pylori* infection in their population [29]. A study in US reported a prevalence of PUD of 11.43%, 11.52% and 6% in current, former and non-smokers, respectively [32]. In Hong Kong a study reported that 60.9% patients with PUD were in the age group of 60–70 years [33] where as another study showed that individuals in the age group of 40–49 years were significantly more likely to have PUD than those between 30–39 years [29].

Limitations

The present study has some limitations. First correlation between the risk factors like smoking, medications and occurrence of significant endoscopic findings was not done because the specific details were not available for all the study subjects. Second we did not correlate between *H Pylori* infection and endoscopic findings which might have precluded us from inferring on the reason for high prevalence of significant endoscopic findings.

Conclusions

In conclusion the prevalence of abnormal endoscopic findings was high in subjects presenting with dyspepsia across all age groups and nationalities. Gastritis was the most common endoscopic finding observed followed by esophagitis. The most common presenting symptoms were epigastric pain and heartburn. The prevalence of gastric ulcer was significantly high in patients above 60 years and the prevalence of gastric carcinoma was low in the study population.

Abbreviations

NICE-National institute for health care and Excellence

PUD-Peptic Ulcer Disease

IBD- Inflammatory Bowel Disease

PPI- Proton Pump Inhibitors

H pylori- Helicobacter Pylori

Declarations

Conflict of interest

The authors declare no conflict of interest

Ethics approval and consent to participate

The study was approved by the ethical committee of the Medical Research Center of Hamad Medical Corporation (Medical Research Center approval number #14105/14). An exemption from obtaining informed consent was granted

Consent for publication

Not applicable

Availability of Data and materials

The datasets analysed during the current study available from the corresponding author on reasonable request

Competing interest

The authors declare that they have no competing interest

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Authorship

AB- Study design, data collection, manuscript writing

VAN- Study design, data collection, analysis, manuscript writing, editing

NP- Study design, data collection, analysis, manuscript writing, editing

PC- Data analysis, manuscript writing, editing

HZ- Data collection, analysis, manuscript writing

FP- Data collection, analysis, manuscript writing

AQ- Data collection, analysis, manuscript writing

MM-Data collection, analysis, manuscript writing

AE- Data analysis, manuscript writing, editing

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