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Original Research Article

Upper gastrointestinal endoscopic findings in patients presenting to Tamale Teaching Hospital, Ghana

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Background and objectives:Patients with dyspeptic symptoms are generally referred for upper gastrointestinal (UGI) endoscopy, which is the reference standard for diagnosis. The objective of the present study was to categorize the reasons for referral forUGI endoscopy and to evaluate the clinical findings of patients presented to the Tamale Teaching Hospitalin Northern Ghana.
Materials and methods:This study was a retrospective review of medical records from patients presented to the Tamale Teaching Hospital between October 2010 and October 2014 for UGI endoscopy indications. Data including clinical diagnosis, endoscopy findings, *Campylobacter*-like organism test results, and histopathology reports were collected and evaluated.
Results: During the study period, a total of 2414 (1215 female, 1199 male) patients with a mean age of 40.2 ±16.6 years (range: 2–89 years) were referred for UGI endoscopy. The primary major complaints were epigastric pain (58.9%), dyspepsia (18.4%), recurrent vomiting (8.9%), hematemesis (6.7%), and dysphagia (6.4%). Important endoscopic findings were gastric ulcer (25.6%), gastritis (22.1%), gastroesophageal reflux disease (17.3%),duodenal ulcer (10.3%),UGI bleeding (6.7%), gastric tumor (4.6%), and esophageal tumor (4.1%).
Conclusion: The prevalence of severe UGI disease in this patient cohort suggests that additional centers are needed in northern Ghana for more timely detection.

Keywords: Endoscopy; Gastrointestinal diseases; Health resources

INTRODUCTION

Following the development of flexible fiber-optic endoscopes in the early 1970s [1],upper gastrointestinal (UGI) endoscopy became a conventional medical practice worldwide.Flexible endoscopy can provide a definitive diagnosis, leading to early treatment of UGI pathologies, and is considered the reference standard for the diagnosis and management of dyspeptic syndromes in sub-Saharan Africa[2].However, endoscopy is available in only a few healthcare centers in Ghana.It is possible that this lack of endoscopic resources results in later presentations of more severe UGI disease. To investigate this, a retrospective analysis of patients who underwent UGI endoscopy at the Tamale Teaching Hospital (TTH) in northern Ghana was conducted in an effort to determine the indications for UGI endoscopy and frequencies of UGI pathologies.

MATERIAL AND METHODS

This was a cross-sectional, retrospective study of data obtained from medical records of patients who underwent UGI endoscopy at the Minimal Access Therapy and Operative Endoscopy unit in the Department of Surgery of the TTH between October 2010 and October 2014.UGI was performed by general surgeons and internal medicine physicians with training and experience in endoscopy using avideo-endoscopy system (EVIS 140 series; Olympus Corp., Shinjuku, Tokyo, Japan).

The records of all patients undergoing UGI endoscopy in the unit during the study period were eligible for review.

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Data on patient age, sex, indications for referral for UGI endoscopy, clinical diagnosis, endoscopy findings, histopathology reports, and *Campylobacter*-like organism (CLO) test results were collected.

Data was analyzed using SPSS version 16.0 statistical software (SPSS Inc., Chicago, IL, USA).Fisher's exact text is used to determine association between CLO test results and histopathologic findings< 0.05 was considered as significant. Ethical clearance was obtained from the Internal Review Board of the TTH.

RESULTS

A total of 2414 patients with a mean age of 40.2 ± 16.6 years (range: 2–89 years) underwent UGI endoscopy at the TTH between October 2010 and October 2014. The basic demographic characteristics and clinical findings are presented in Table 1. A large proportion (1173/2414; 48.6%) of patients were between 21 years and 40 years of age.Gastritis and gastric ulcers were the most frequent conditions in these patients (Figure 1). The most common presenting symptom was epigastric pain, reported in1423/2414(58.9%) patients.CLO test results were available in 2097 patients (86.9% of the cohort). There were strong associations between a positive test result and histopathologic findings of gastric adenocarcinoma, gastritis, intestinal metaplasia, and esophageal adenocarcinoma (all $P< 0.01$) (Table 2).

Biopsy results were available from 935/2414(38.7%) patients. The most common histopathologic finding was gastritis, which was reported in 352/935 (37.6%) patients (Table 3). Only 19/935 (2.0%) histopathology biopsies were normal.

DISCUSSION

Endoscopy is the gold standard for diagnosis of gastro intestinal diseases worldwide[3]. The indications for endoscopy need to be continually revised, particularly with respect to endoscopic findings and the relevance of *Helicobacter pylori* infection [4, 5].Moreover, it is important to determine the indications based on geographic location. For example, an equal number of male and female patients were evaluated by UGI endoscopy in the present study, which differs from studies from Saudi Arabia [6] and Pakistan [7] that included significantly more female patients, as well as other studies that reported 54.9% male patients[8–13].However, the majority of patients were 20–60 years of age, similar to previous studies [6, 7, 13].Furthermore, the symptoms of patients leading to the referral for UGI endoscopy in this study are similar to other publications [10, 14]. However,lower incidences of epigastric pain (16%) and higher incidencesof dysphagia (37%) and hematemesis(21–27%) have been reported [2, 15].

With regard to endoscopic findings, the results of this study show that peptic ulcer disease is more common in patients 20–40 years of age,which is consistent with previous studies in Ghana[13, 16,17]. However, the 2.4:1 ratio of gastric to duodenal ulcers is inconsistent with the findings of 1:6.1 from previous publications [13, 17]. Furthermore, approximately 2.2% of patients in the present study had a normal endoscopic finding,which is in contrast to studies reporting values of 20–50% [2, 13, 14, 16–18].The discrepancy may be attributable to a difference in the healthcare-seeking behavior of individuals in northern Ghana.

Positive CLO tests were obtained in 74.4% of the patients tested in this study, which is in line with the 61–100% rate of *H. pylori* infection in Africa [19, 20]. Moreover, there were significant associations between positive CLO test results and histopathologic findings of gastric adenocarcinoma, gastritis, intestinal metaplasia, and esophageal adenocarcinoma. Thus, the population studied does not fall within the "African enigma," which refers to the discrepancy between the *H. pylori* infection rate in Africa and the incidence of gastric adenocarcinoma [21]. These findings suggest that the histopathology is more objective than macroscopic endoscopy findings.

The frequency of esophageal malignancy found by histopathology in the present study is consistent with other studies [2, 14, 22, 23].However, esophageal adenocarcinoma was more common (9.1%) among patients in this study, whereas esophageal squamous cell carcinoma was more common in studies from southeastern Africa, Iran, and China [14, 22–27].This may be due to the prevalence of gastroesophageal reflux disease and Barrett's esophagitis among the patients in the current study.In addition, all the patients with esophageal cancers presented with obstructive symptoms.

The gastric outlet obstructions found in 103 patients were caused by gastric cancer ($n = 80$) or peptic ulcer disease ($n = 23$), which is consistent with previous studies from Ghana [28]. Moreover, reports from East Africa found esophageal varices to be the commonest cause of UGI bleeding[3, 14, 29], which is in line with what was observed in the present study. However, 81.1% of patients with UGI bleeding had esophageal varices in the present study, whereas previous studies from West Africa reported lower incidences ranging between 1.9% and 3.8%[4, 13,17, 30].

CONCLUSION

The histopathology reports available from endoscopy biopsies in this study indicate that there is a high incidence of advanced disease in northern Ghana endoscopy patients, which suggests that their referrals for evaluation are delayed. This may be explained by a tradition or culture of seeking healthcare only after all other options have been exploited, or by an inadequate availability of endoscopy centers in Ghana. Increased awareness of the benefits of early detection will help individuals obtain more timely health evaluations and diagnoses.

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CONFLICTS OF INTEREST: None

Table 1.Patient characteristics (*n* = 2414)

Characteristic	*n*	%
Age, yr		
1–10	11	0.5
11–20	204	8.5
21–30	595	24.6
31–40	578	23.9
41–50	410	17.0
51–60	300	12.4
61–70	126	5.2
71–80	174	7.2
>80	16	0.7
Sex		
Female	1215	50.3
Male	1199	49.7
Primary complaint		
Epigastric pain	1423	58.9
Heartburn	443	18.4
Persistent vomiting	214	8.9
Hematemesis	162	6.7
Dysphagia	155	6.4
Melena stool	12	0.5
Foreign body ingestion	5	0.2
Clinical diagnosis		
Peptic ulcer disease	1865	77.3
Gastroesophageal reflux disease	215	8.9
UGI bleeding	158	6.5
Gastric cancer	87	3.6
Esophageal cancer	82	3.4
Foreign body ingestion	7	0.3
Campylobacter-like organism test (*n* = 2097)		
Positive	1561	74.4
Negative	536	25.6
Endoscopy findings (*n* = 2414)		
Gastric ulcer	609	25.2
Gastritis	534	22.1
Gastroesophageal reflux disease	417	17.3
Duodenal ulcer	249	10.3
UGI bleeding	159	6.7
Gastric tumor	112	4.6
Esophageal tumor	99	4.1
Barrett's esophagus	90	3.7
Normal	52	2.2
Others	13	0.5

UGI: Upper gastrointestinal.

Table 2. Histopathology according to *Campylobacter*-like organism test results

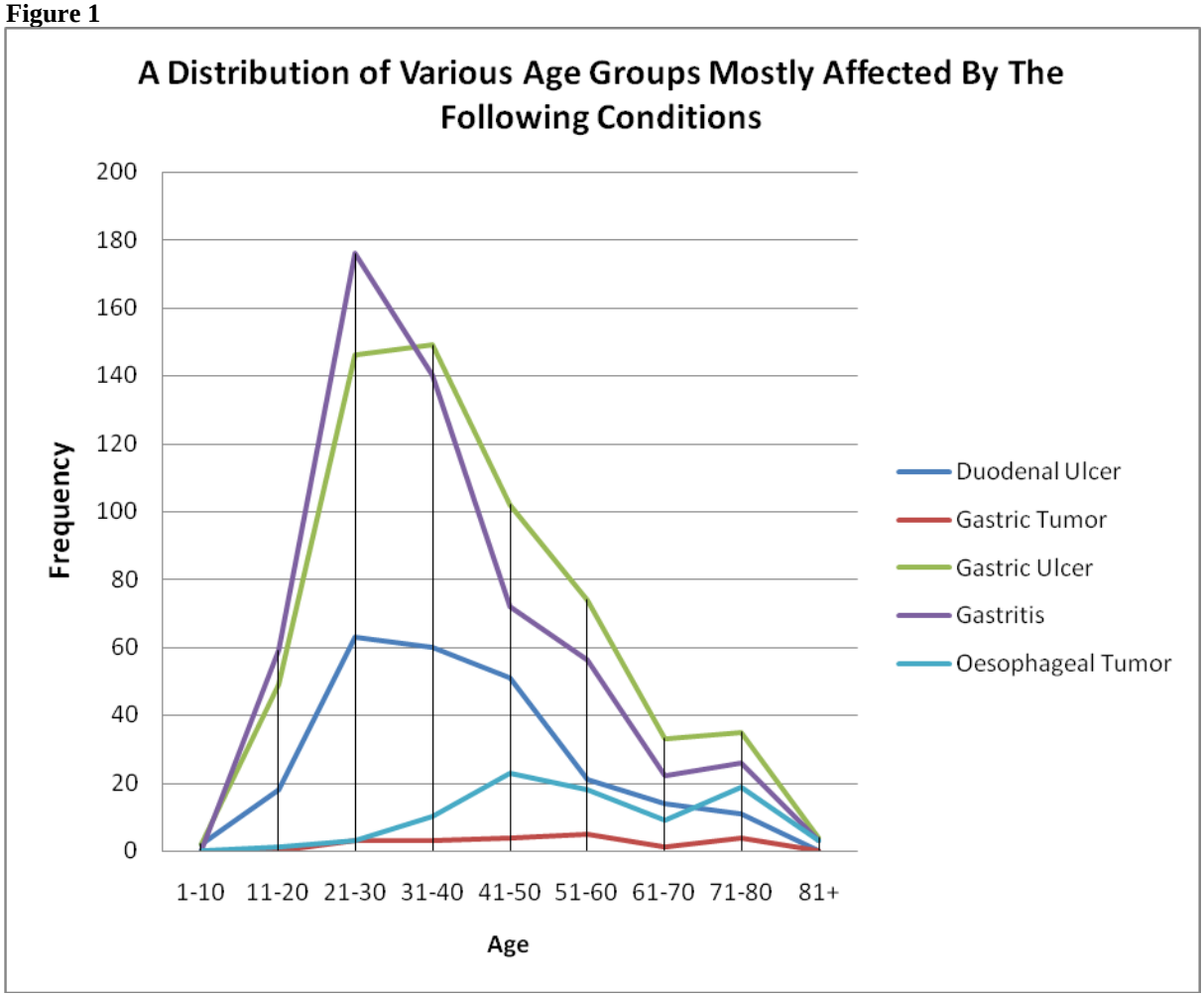
Histopathology	Negative	Positive	Total
Gastric adenocarcinoma	29	35*	64
Gastritis	83	262*	345
Intestinal metaplasia	26	73*	99
Esophageal adenocarcinoma	4	8*	12
Total	142	378	520

*$P < 0.01$ *vs*negative result by Fischer's exact test.

Table 3.Histopathologic findings from endoscopicbiopsies(*n*= 935)

Histopathology	*n*	%
Gastritis	352	37.6
Gastric adenocarcinoma	161	17.2
Intestinal metaplasia	121	12.9
Esophageal adenocarcinoma	85	9.1
Esophagitis	68	7.3
Barrett's esophagus	68	7.3
Gastric ulcer	39	4.2
Normal	19	2.0
Squamous cell carcinoma of the esophagus	9	1.0
Inflammatory/hyperplastic gastric polyp	9	1.0
Inadequate tissue sample	4	0.4

Figure 1


A Distribution of Various Age Groups Mostly Affected By The Following Conditions
Frequency
200
180
160
140
120
100
80
60
40
20
0
1-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81+
Age
Duodenal Ulcer
Gastric Tumor
Gastric Ulcer
Gastritis
Oesophageal Tumor

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