



## An Evaluation of 605 Endoscopic Examination in a Rural Setting, Lacor Hospital in Northern Uganda

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### Authors' contributions

This work was carried out in collaboration between all authors. Author TRO designed the study, wrote the protocol and wrote the first draft of the manuscript. Author DMO managed the literature searches and review and discussion. Author NOA did analyses of the study and critique of write-up. Author IP managed the samples. All authors read and approved the final manuscript.

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### ABSTRACT

**Introduction:** The aim of this study was to evaluate the profile of esophagogastroduodenal (EGDS) diseases diagnosed by upper endoscopy in a rural area of Uganda in a retro-protective study of 605 patients.

**Results:** The mean age of patients with digestive symptoms was 39.7yrs (SD +/-16.11) and female gender predominated by 60% compared to the male (P value 0.000). Peasant farmers were the commonest group with GI symptoms requiring EGDS compared to the rest 72.1% v 27.9%. Epigastric pain was the commonest indication (58%) for EGDS, followed by chest pain (11%), abdominal pain (8.8%), dysphagia (7.6%) and hematemesis (7.3%). The commonest endoscopy finding was gastritis (47.9%) followed by esophagitis (14.4%), cancer esophagus (5.1%), esophageal varicose (4%), PUD (2.3%), gastric cancer (1%). However 19.5% of patients had normal EGDS. There was a significant correlation between the outpatient diagnosis and

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endoscopy finding (P value 0.01,  $r = 0.144$ ) and between endoscopy finding and histology findings (P value 0.001,  $r = 0.236$ ). *H. pylori* was positive in 53% of patients with gastritis.

**Conclusion:** Gastritis is the commonest lesion (47.9%) of which 53% have *H. pylori* and Cancer esophagus account for 5.1% of GI lesion in our setting. Cancer stomach is rare in our setting.

**Keywords:** Upper Gi-endoscopy; indication; findings; gastritis; peptic ulcer; *H. pylori*.

## 1. INTRODUCTION

Endoscopy is the ideal procedure for identifying organic diseases of the foregut and its practice is influenced by epidemiology of gastrointestinal (GI) diseases [1]. Results from endoscopic exam allow association of Esophagogastroduodenal (EGDS) findings with patient presentation and extrapolation of the findings to patient population in clinical practice, outside of traditional medical centers [2]. Although 39% of EGDS performed have inappropriate indications, better diagnostic yield depend appropriateness, patient gender and age, treatment setting, and symptoms [3]. Indications for EGDS vary from region to region and many authors have found varying proportions of indications for endoscopy.

Dyspepsia represent the commonest indication in the USA, Pakistan and Ethiopia [4,5,6] as well as in Nigeria and is followed by upper gastrointestinal bleeding [7]. However, epigastralgia was found to represent the commonest indication for EDGS (47.7%) and it is followed by diffuse abdominal pain (21.8%) and repeat procedure (19.1%) [8]. In Uganda Okello (2006) [9] also found the main indications to comprise of epigastric pain (67.4%), dyspepsia (11.9), hematemesis (8.9%), recurrent abdominal pain (3%), recurrent vomiting (3%), and miscellaneous (5.8%). In epigastralgia, 39% of procedures lead to the discovery of disease [8].

Despite the varying indications, most studies have reported anecdotal proportion of GI lesions depending on the regions. In Canada, Peptic Ulcer Disease (PUD) account for 7.5% of EGDS finding, celiac disease (2.5%), and upper gastrointestinal cancer 0.9% [10]. However in Lagos Nigeria, the commonest endoscopic findings are; gastroesophageal reflux disease, followed by gastroduodenitis [11]. While in Togo, the most common lesions consist of PUD (34.2%), inflammatory disease such as esophagitis, gastritis, bulboduodenitis (32.4%), gastroduodenal bile reflux (9.3%), pylorobulbar stenosis (5.5%), tumoral disease (3.7%), and esophageal varicosities (3.7%) [8]. In Kenya gastritis is the most common EGDS finding

(25.8%) [12]. In Uganda Okello [9] found duodenal ulcer in 14.8% of adolescents and gastritis in 12.6%, duodenal scarring (5.2%), bile reflux (5.2%) duodenitis (4.4%). In their EGDS series, the prevalence of *H. pylori* was found to be 37.4% in Uganda and cigarette smoking, poor sanitation, and lack of formal education were the predisposing factors [13]. However there is need to evaluate endoscopy in a rural post conflict community and associate the finding with patient presentation in clinical practice.

### 1.1 Objective

To describe the profile of esophagogastroduodenal (EGDS) diseases diagnosed by upper digestive tract endoscopy (UDTE) in a rural area of Uganda and relate it to the histological findings and *H. pylori*.

## 2. METHODS AND MATERIALS

This retro- prospective study was carried out from Jan 2015 to July 2015 in order to investigate the endoscopic findings in 605 patients who presented to St Mary's Hospital Lacor a large rural based University teaching general hospital with 483 bed located in Northern Uganda. Currently the Hospital has two general surgeons who perform over 1200 upper GI endoscopy per year and each of the surgeons has over 10years experience in EGDS.

All patients with upper gastrointestinal symptoms were first assessed in the out patients unit by a clinician who discretionally decided to book and counsel him/her for EDGS as an elective case in manner standardized manner. On the day of scoping, inform consent was obtained from the patients priory. Those who consented were consecutively recruited and interviewed by the endoscopist to discern the main indication for EGDS and its duration. They were then given lidocaine 1% to gurgle in their throat for 5-10minutes as these causes local numbness in the pharynx and mouth. During the procedure, the endoscopist notes and records the findings and when necessary takes punch biopsy for immediate fixation in standard formalin and send

for histology. The pathologist was required to examine and report on the histology finding as well as *H. pylori* presence after standard staining method with H&E and Giemsa stains. Only patients who could not tolerate the EDGS procedure were excluded. The following variables were obtained and analysed using SPSS version 15 to determine the pattern of esophagogastrointestinal presentation and diseases: Age, Gender, Occupation, indication, Outpatient diagnosis, Endoscopy finding, Histology findings, Presence of malignant cancer, and H Pylori presence.

### 3. RESULTS

#### 3.1 Biographic Data

Approximate 605 patients were enrolled in the study. From Table 1, the age of patients ranged from 5 to 89 yrs old, mean age 39.7 year (SD+/-16.11). The majority of patients with gastrointestinal complaints that required EGDS are the youth of 19-35 yrs old (39%, n=605) and Adults of age group 36-65 yrs (47%, n=605). For all the age groups, the female gender predominated in patients undergoing EGDS procedure and overall a significant majority of patient undergoing EGDS in our setting are females 60% compared with their male counterpart (40%), (*P value 0.000*). However regarding their occupation, 436 (72.1%) were peasant farmers, followed by students 10.7%, teachers (3.6%) and business men/women (3.5%). Therefore, peasant farmers significantly constitute the biggest proportion of patients who have GI symptoms requiring EGDS (*P value 0.000*,  $\chi^2 = 3295.754$ ).

Regarding indications for EGDS, the commonest indication was epigastric pain (58%), followed by chest pain (11%), abdominal pain (8.8%), dysphagia to solids/liquids (7.6%), and hematemesis (7.3%) [Table 2]. Dyspepsia which is rather a vague presentation constituted only 0.7%, (n=605) of the indications. Dyspepsia, anemia, lower abdominal pain, hemoptysis and repeat endoscopy were the least common indication for EGDS.

Table 3 shows the clinical diagnosis made by the examining clinician based on the medical presentation of the patients in the outpatients (OPD) or referring unit. The most common diagnosis made in medical clinical practice in our

setting was gastritis (65%), followed by cancer esophagus (6.3%), Gastroesophageal Reflux Disease (GERD) (5.3%), peptic ulcer disease (PUD) (4.6%), esophagitis (4.6%) and esophageal varices (2.5%). Hence the more diagnosis of gastritis made, the more the outpatient move away from PUD. The least common OPD diagnosis made by clinicians was duodenitis. However in 3.5% of instances the clinician could not make a diagnosis.

**Table 1. Biographic data of endoscopy patients**

	Male	Female	Total
<b>Age group</b>			
Child [0-10yrs]	1(25%)	3(75%)	4
Adolescents [11-18yrs]	13(31%)	29(69%)	42
Youth [19-35yrs]	102(43%)	133(57%)	235
Adults [36-65yrs]	109(39%)	173(61%)	282
Elderly $\geq$ 66yrs	18(43%)	24(57%)	42
	<b>243(40%)</b>	<b>362(60%)</b>	<b>605</b>
<b>Occupation</b>	<b>Frequency</b>	<b>Percent</b>	
Peasant	436	72.1	
Student	65	10.7	
Teacher	22	3.6	
Health worker	12	2	
Business	21	3.5	
Tailor	5	0.8	
Carpenter	1	0.2	
Askari	2	0.3	
Others	35	5.8	
Armed forces	1	0.2	
Fisherman	1	0.2	
Civil servant	4	0.7	
<b>Total</b>	<b>605</b>	<b>100%</b>	

**Table 2. Indication for endoscopy**

Indication	Frequency	Percent (%)
Epigastric pain	351	58
Hematemesis	44	7.3
Vomiting	12	2
Dysphagia	46	7.6
Ordinopagia	7	1.2
Dyspepsia	4	0.7
Control (Review) endoscope	1	0.2
Abdominal pain	53	8.8
Throat pain	11	1.8
Chest pain	67	11.1
Malena stool	5	0.8
Anemia	1	0.2
Lower Abd. pain	1	0.2
Hemoptysis	2	0.3
<b>Total</b>	<b>605</b>	<b>100</b>

**Table 3. Outpatient diagnosis**

OPD diagnosis	Frequency	Percent
PUD	28	4.6
Gastritis	393	65
Esophagistis	28	4.6
Upper GI bleed UGIB	15	2.5
Esophageal varices	16	2.6
Duodenitis	1	0.2
GERD	32	5.3
Ca esophagus	38	6.3
Ca stomach	8	1.3
GOO	5	0.8
None	21	3.5
Achalasia	2	0.4
Blood disorder	2	0.3
Bile reflux	2	0.3
Pancreatitis	5	0.8
Esophageal stricture	4	0.7
Diabetes miletus	1	0.2
Pluerisy	2	0.3
Anemia	2	0.3
<b>Total</b>	<b>605</b>	<b>100</b>

Whereas the clinician made diagnosis basing on the clinical presentation and referred the patient for EDGS, out of the 605 patients studied, the endoscopist found gastritis (47.9%) to be the commonest condition affecting gastrointestinal symptoms patients in our community. This was followed by esophagitis (14.4%), cancer esophagus (5.1%), esophageal varicose (4%) and PUD (2.3%), (Table 4). Whereas 19.5% of patients who were scoped were found to be normal, hiatus hernia and cancer stomach accounted for the least lesion found that is, only 1% of the upper Gi diseases in our setting respectively. There was a significant correlation between the outpatient diagnosis and endoscopy finding, (*P value 0.01, r = 0.144*). Therefore in our clinical setting with paucity of resources, clinician could initiate treated without waiting for endoscopy results.

Table 5 shows that a total of 121 biopsies representing 20% (n=605), were done. When the histology finding is compared with the endoscopy findings, there was a significant correlation between them (*P value 0.01, r = 0.236*). However out of the 88 biopsies of gastric mucosa done, 47 (53%) had *H. Pylori* present and of the 2 PUDs that were biopsied, 1 was positive for *H. pylori*. However *H. pylori* was negative in patients with ca esophagus, duodenitis, gastric polyp and gastric adenomai. Therefore our finding avers that H.pylori infection was most commonly associated with gastritis.

**Table 4. Endoscopy findings**

Endoscopy findings	Frequency	Percent
PUD	14	2.3
Gastritis	290	47.9
Esophagistis	87	14.4
Ca esophagus	31	5.1
Esophageal varices	24	4
GERD	16	2.6
Duodenitis	4	0.7
Ca stomach	6	1
Haitus hernia	6	1
Normal	118	19.5
Deformed duodenal bulb	3	0.5
Gastric polyp	2	0.3
Esophageal stricture	1	0.2
Ca tongue	1	0.2
mallory weiss tear	1	0.2
Achalasia	1	0.2
<b>Total</b>	<b>605</b>	<b>100</b>

**Table 5. Helicobacter pylori presence**

	<i>H. pylori</i> present			Total
	No	Yes	NA	
PUD	1	1	0	2
Gastritis	40 (47%)	47 (53%)	1	88
duodenitis	1	0	1	2
Ca esophagus	25	0	3	28
Ca stomach	0	0	1	1
Normal	2	0	1	3
Not Applicable (NA)	1	0	476	477
Severe dysplasia	0	0	1	1
Hyperplastic Polyp	2	0	0	2
Gastric adenoma	1	0	0	1
<b>Total</b>	<b>73</b>	<b>48</b>	<b>484</b>	<b>605</b>

#### 4. DISCUSSION

Endoscopy remains a powerful tool in diagnosis and management of GI conditions. In this study of Esophagogastroduodenoscopy (EGDS), the mean age of patients requiring the procedure was 39.7year (SD+/- 16.11) which is similar to the mean age of 37.7 years (range: 15-84 years) reported by Djibril et al. 2009 [8]. Like in this study, many other others have found a higher female preponderance over their male counterpart in Nigeria, Togo and Uganda respectively [7,8,9]. Perhaps this relate to the female patients' better health seeking behavior compared to their male counterpart. Peasant farming was a significantly predominant

occupation amongst the 605 patients studied ( $P$  value 0.000). In our setting peasant farmers are often poor people living in areas with poor sanitation and most often lack formal education. Tsongo et al. [13], found that poor sanitation, and lack of formal education constitute significant predisposition factors to *H. Pylori* infection.

The indications for EGDS vary with patients' description of what they feel. Whereas most studies found dyspepsia to be the leading indication [5,7,8] this study found epigastric pain to be the leading indication for EGDS (58%). Epigastralgia was also reported to be the leading indication of EGDS by Olokoba et al. [7] and Okello [9]. Most patients in our setting are able to finger point to their epigastrium as painful part and hence the reason for them requiring EGDS. With respect to the indication, the examining clinician had to make a diagnosis prior to referring the patient for EGDS. The most common diagnosis made in medical clinical practice in our setting was gastritis (65%), followed by cancer esophagus (6.3%) Gastroesophageal Reflux Disease (GERD) (5.3%), peptic ulcer disease (PUD) (4.6%), esophagitis (4.6%) and esophageal varices (2.5%). There was a positive significant correlation between OPD diagnoses ( $P$  value 0.01,  $r = 0.144$ ) and EGDS findings. Accuracy of diagnosis relates to experience and expertise of the clinician and it helps to reduce patient anguish and save resources because treatment can be initiated based on clinical diagnosis.

Endoscopically, the commonest lesion identified was gastritis (47.9%) followed by esophagitis (14.4%), cancer esophagus (5.1%), esophageal varicose (4%), PUD (2.3%) and 19.5% ( $n=605$ ) of patients who were scoped were normal. These findings had a positive and significant correlation to the histological findings, ( $P$  value 0.001,  $r = 0.236$ ). Therefore endoscopist working in our setting could diagnose most of the GI disorders based on their examination alone. The rate of gastritis in this study is higher than most other studies, for example, in a student health center study by Schroeder [15] in Scandinavia, reported overall gastritis rate of 22.1%. The risk factors for *H. Pylori* infection [13] tend to mirror that of gastritis. Whilst Lodenyo, Rana, Mutuma, Kabanga, Kuria et al. [14] found gastritis rate of 25.8% in Kenya, 6% was reported in Ethiopia [6] and 12.6% in Uganda [9]. Whereas Gherasim and Dranga [16] attributes gastritis to chronic alcohol consumption, amount and frequency, our predominantly peasant community often suffer

poor sanitation and lack of education on top of chronic alcohol ingestion in "sackets" as crude spirits. These risk factors combined predispose to high rates of *H pylori* infection [13], cancer esophagus as well as liver diseases. The low rate of PUD found in this study is congruent to fact that the disease has demonstrated a decreasing prevalence and incidence over the years globally as well as in the Philippines [17,18]. More than half (53%,  $n=88$ ) of the gastric and PUD (50%,  $n=2$ ) biopsies showed presence of *H. Pylori*. The association between *H. pylori* and gastritis has been found by other researchers in Brazil and Germany as well [19, 20]. Furthermore, the severer the gastritis the more difficult to eradicate *H. Pylori* [21], yet their safe eradication is necessary for the prevention of gastric cancer [22]. The high prevalence of Hepatitis B infection in our community [23] makes liver disease, chronic alcoholism, esophageal lesion more precarious, hence the high rate of esophageal varicose However cancer stomach is rare in our setting (1%).

## 5. LIMITATION

The major limitation experienced in the study was related to 5 cases whose tissue histology could not be read, this was caused by a wrong formalin concentration supplied, but such cases were excluded from the study. The other limitation was related to difficulty in follow-up of the cases that met the inclusion criteria, but this was circumvented by using a cross-section survey.

## 6. CONCLUSION

The female gender, youth and adults who are poor peasants predominate amongst patients with upper digestive tract symptoms requiring EGDS. Whereas 19.5% their EGDS is normal, gastritis represent commonest lesion in them (47.9%) and 53% of the gastritis have *H pylori*. Cancer esophagus which accounted for 5.1% of GI lesion is also important ailment in our setting but cancer stomach is rare in our environment.

## 7. RECOMMENDATION

Clinician in resource limited areas could initiate treatment basing on clinical diagnosis since there is a correlation between clinical diagnosis, endoscopy and histological findings as this will reduce unnecessary referral and suffering of the patient. Treating of gastritis should aim at eradicating *H pylori*.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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