

# Upper gastrointestinal diseases in patients for endoscopy in South-Western Uganda

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## Abstract:

**Background:** There is a paucity of published data regarding upper gastrointestinal diseases in Ugandans with upper gastrointestinal symptoms referred for endoscopy.

**Objectives:** To study the presenting complaints, pathology and Helicobacter pylori prevalence among patients with upper gastrointestinal symptoms in South-Western Uganda.

**Methods:** Patients presenting with upper gastrointestinal symptoms underwent upper endoscopy and a urease test for Helicobacter Pylori, all suspicious lesions were biopsied for histopathology review as appropriate.

**Results:** The most common presenting complaints were epigastric pain (51.6%), dysphagia (13.6%) and odynophagia (7.1%). The most common endoscopy finding was gastritis (40.2%), followed by normal examination (15.2%), oesophageal cancer (13.6%), gastric ulcer (7.6%) and gastric cancer (7.1%). Patients older than 40 years (n=110) had significant findings including gastritis (50.9%), oesophageal cancer (22.7%) and gastric cancer (11.8%). However in younger patients, with the age range of 18-40 years (n=74), most examinations were normal (92.9%). Of the 176 patients able to undergo Helicobacter pylori testing 75.6% were positive. Helicobacter pylori infection was associated with statistically significant increase in gastritis, oesophageal cancer, gastric ulcer, gastric cancer, and duodenal ulcers (p-values < 0.05).

**Conclusion:** Gastritis, ulcerative disease, and upper gastrointestinal malignancies are common in South-Western Ugandans and are associated with a high prevalence of Helicobacter pylori.

**Keywords:** Upper gastrointestinal symptoms, Pathology, Urease test, Helicobacter pylori, Endoscopy, Uganda.

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## Introduction:

The evaluation of upper gastrointestinal symptoms in a medically resource limited area can be challenging. The lack of medical personnel, including those trained in upper endoscopy and limited facilities, can limit the ability for appropriate evaluation for patients with upper gastrointestinal complaints.

Symptoms such as epigastric pain, dysphagia, odynophagia, heartburn, nausea, bloating and early satiety arising from the upper gastrointestinal tract are common.<sup>1,2</sup> The pathology underlying upper gastrointestinal symptoms is varied and may be associated with significant morbidity and mortality.<sup>2</sup>

Helicobacter pylori is a gram negative, spiral shaped, flagellated, bacillus; it remains one of the world's most common bacterial infections.<sup>3</sup> H. pylori infection is associated with a number of upper gastrointestinal disorders, including chronic active gastritis, peptic ulcer disease and gastric cancer.<sup>4</sup> The prevalence of H. pylori infection worldwide varies greatly among countries, the infection is more common in developing countries where the prevalence rate ranges between 70 and 90% as compared to 20-50% in developed countries.<sup>5</sup> The overall prevalence rate of H.pylori infection strongly correlates with low socioeconomic status, low living

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standards, poor personal and environmental hygiene, presence of *H.pylori*-positive family members and increasing age.<sup>6</sup>

Data on upper gastrointestinal diseases, *H. pylori* prevalence based on urease test among patients with upper gastrointestinal symptoms undergoing endoscopy in Uganda are limited. There have been previous reports about endoscopic findings in patients with upper gastrointestinal symptoms.<sup>7,8</sup> While this data is informative, its coverage is limited to HIV/AIDS patients and those patients presenting with upper gastrointestinal bleeding. There is thus a need for more data on upper gastrointestinal diseases from Uganda.

Identification of upper gastrointestinal symptoms, associated pathology and *H.pylori* will enable establishment of preventive measures for these diseases and in addition decrease the need for endoscopy especially in this resource limited setting. Therefore this study was conducted to evaluate the symptoms, pathology, the prevalence of *Helicobacter pylori* in patients with upper gastrointestinal symptoms presenting in Mbarara, Uganda.

## **Methods:**

### **Study population and data collection**

This was a cross-sectional study in which patients were prospectively recruited from those referred for upper gastrointestinal endoscopy at Mbarara University Teaching Hospital, Uganda, a referral center for patients from South-Western Uganda. Data collected on each patient included age, sex, occupation, educational status, referral complaints, HIV status, endoscopic findings, histology, and *Helicobacter pylori* results.

### **Endoscopic assessment**

All the patients gave informed consent and the procedure was elective. Clinical symptoms were assessed in a systematic manner. The endoscopic evaluation of patients was performed using a sterile Olympus video gastroscope from Olympus Medical. Patients received 2 mls of a 10% lidocaine spray orally while seated on table and waited between 1-5 minutes after the spray for oropharyngeal anesthesia to take effect before the endoscopy procedure. Patients who were referred for endoscopy and turned down procedure after going through with them to obtain informed consent were not included in the study, 6 patients refused the procedure and they were excluded.

All examinations were performed by the same operator (S.O.) who had been trained in endoscopy at Bristol Royal Infirmary Hospital, University of Bristol and Cairo Endoscopy Training Centre, Egypt.

### ***Helicobacter pylori* status**

Out of 184 patients who were scoped, 176 patients underwent gastric antral mucosal biopsies to determine *H. pylori* status. These biopsies were tested using a rapid urease test (CLO kit, a container impregnated with rapid urease test manufactured by Cambridge Life Science Ltd 14 St.Thomas' Place, Cambridgeshire Business Park, Ely, Cambs CB74EX UK) which was observed for colour change. Biopsies were placed immediately in the solution in the CLO kit and in the presence of *H pylori* the solution in the CLO kit which turned from yellow to pink. Where colour change did not occur immediately the solution was observed up to 24 hours later. If no colour change took place at 24 hours, the CLO kit was discarded and the result recorded as negative for *H. pylori* irrespective of treatment with proton pump inhibitor or other therapy.

### **Histology**

In 8 patients the scope could not be passed beyond the oesophagus to the stomach due oesophageal lumen obliteration by bleedy masses suspicious of malignancies, biopsies were only obtained from the oesophagus for histopathology. In addition to antrum biopsies to determine *H.pylori* status in 176 patients biopsies were also obtained at the same time from all cases of oesophagitis, gastritis, duodenitis, gastric ulcer, duodenal ulcer, and suspected malignant lesions and the specimens were fixed in 10% buffered formalin and transferred to the histopathology laboratory for histopathology review.

All the biopsy samples were examined by the same histopathologist, Prof. Amnia Diaz of the pathology department Mbarara University Teaching Hospital.

### **Statistics**

For each disease, and for *H. pylori* infection, prevalence was expressed as the percentage occurrence in the study population. The relationship between *H. pylori* and endoscopic findings was determined by cross tabulation, calculation of p-values, odd ratios and confidence intervals (a p-value of < 0.05 was considered significant, using Stata program 10.0).

**Ethical permission:**

The study was approved by the Research and Ethics Committee of Mbarara University of Science and Technology. A written informed consent (which was written in both local Runyakore/Rukiga language and English) was obtained from all patients and respect for confidentiality was ensured.

**Results:**

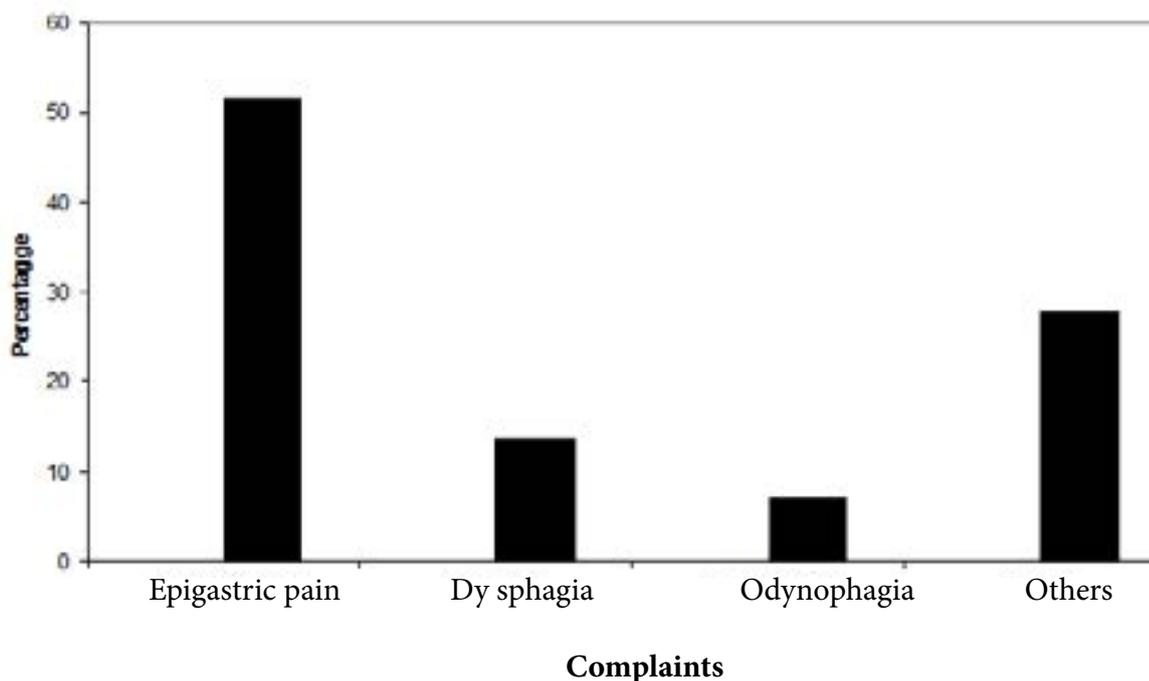
A total of 184 patients who underwent upper gastrointestinal endoscopy were enrolled in this study, their age ranged from 18 to 90 years, with a mean of 53.5 years (SD +/- 17.8).

**Table 1: The demographics of patients in the study**

Characteristics		N	(%)
Sex	Males	110	59.8
	Females	74	40.2
Occupation	Agriculture	119	65
	Civil servant	34	18
	Student	16	9
	Others	15	8
Education	Primary	108	58.7
	Secondary	31	16.8
	Tertiary	45	24.5
HIV status	Positive	16	8.7
	Negative	136	73.9
	Declined testing	32	17.4

The majority of patients were men (59.8%). Most of the patients worked in agriculture (65%) followed by civil service positions (18%), students (9%), and other (8%) occupations. Majority of the patients enrolled

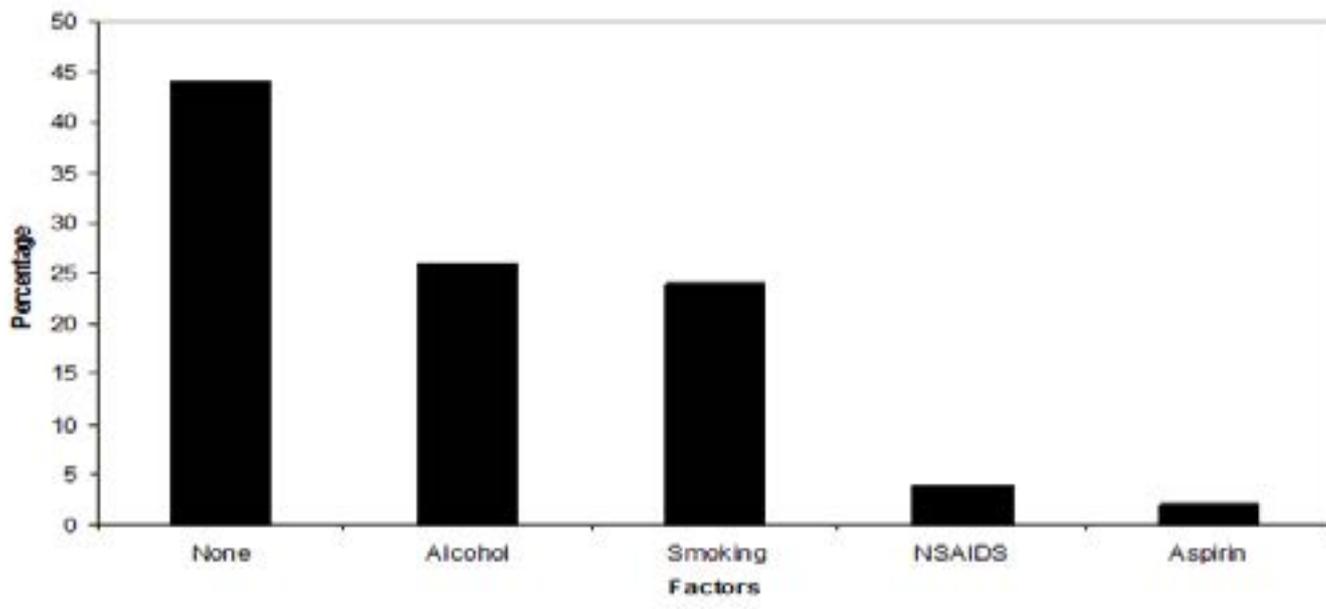
had primary education (58.7%) followed by tertiary (24.5%) then secondary 16.8%. The HIV status in this patient population was HIV negative 73.9%, HIV positive 8.7%, and the remaining patients (17.4%) declined a HIV test (Table1).

**Figure 1: Primary gastrointestinal symptoms at presentation before endoscopy.**

In Fig 1, the main indications for endoscopy were epigastric pain (51.6%), dysphagia (13.6%), and odynophagia (7.1%), other symptoms cited included vomit-

ing, nausea, heartburn, bloating, early satiety and weight loss (27.7%).

**Figure 2: The risk factors for upper gastrointestinal symptoms reported during patient's assessment on history.**



In Fig 2, the majority of patients (44%) did not have obvious sources for their symptoms. Risk factors in-

cluded alcohol consumption (26%), smoked tobacco (24%), non-steroidal anti-inflammatory drugs (4%) and aspirin use (2%).

**Table 2: Histological and endoscopic findings of patients who underwent endoscopy**

Results	No of cases	(%)
Gastritis	74	40.2
Normal	28	15.2
Oesophageal cancer	25	13.6
Gastric ulcer	14	7.6
Gastric cancer	13	7.1
Oesophagitis	11	6
Duodenitis	10	5.4
Duodenal ulcer	7	3.8
Oesophageal varices	2	1.1
<b>Total</b>	<b>184</b>	<b>100</b>

Gastritis (40.2%) was the most common finding followed by normal exam (15.2%), oesophageal cancer (13.6%), gastric ulcer (7.6%), and gastric cancer (7.1%).

Less common diagnoses included oesophagitis (6.0%) duodenitis (5.4%), duodenal ulcers (3.8%), and oesophageal varices at 1.1% (Table 2).

**Table 3: The relationship between pathology and age**

Findings	Age group				Total	(%)
	≤20	21 – 30	31 – 40	>40		
Gastritis	3	8	7	56	74	40.2
Normal	7	16	3	2	28	15.2
Oesophageal cancer	0	0	0	25	25	13.6
Gastric ulcer	0	4	4	6	14	7.6
Gastric cancer	0	0	0	13	13	7.1
Oesophagitis	0	2	4	5	11	6.0
Duodenitis	0	2	5	3	10	5.4
Duodenal ulcer	1	2	4	0	7	3.8
Oesophageal varices	0	0	2	0	2	1.1
<b>Total</b>	<b>11</b>	<b>34</b>	<b>29</b>	<b>110</b>	<b>184</b>	<b>100</b>

Gastritis was the most common finding in patients over 40 years of age followed by oesophageal cancer, gastric cancer, gastric ulcer, and oesophagitis. All of the cancers were found in patients older than 40 years. 2 patients over the age of 40 years undergoing endoscopy had a normal examination (Table 3).

Patients younger than 40 years of age most commonly had normal findings at endoscopy followed by gastritis, gastric ulcer, both duodenitis and duodenal ulcers. There were no cases of oesophageal or gastric carcinomas found in patients less than 40 years old (Table 3).

**Table 4: The relationship between common gastric lesions and Helicobacter pylori infection**

Common gastric lesions (N)	H.pylori results		OR(95%CI)	P –value
	N (%)			
	Positive	Negative		
Gastritis (74)	69(93.2)	5(6.8)	20.7(6.34-67.64)	0.001
Oesophageal cancer (17)	14(82.4)	3(17.6)	7.2 (1.68-31.04)	0.003
Gastric ulcer (14)	13(92.9)	1(7.1)	21.6(2.48-188.72)	0.001
Gastric cancer (13)	12(92.3)	1(7.7)	18.5(2.10-163.47)	0.001
Duodenal ulcer (7)	6(85.7)	1(14.3)	10.8 ( 1.17-100.44)	0.021

OR: odds ratio; 95%CI: 95% confidence intervals.

There were statistically significant findings in the setting of Helicobacter pylori infection with p-values < 0.05 in patients with gastric lesions which included gastritis (93.2%), oesophageal cancer (82.4%), gastric ulcers (92.9%), gastric cancer (92.3%) and duodenal ulcers at 85.7% (table 4).

Of the 184 participants of this study we were able to test 176 for Helicobacter pylori. Not all patients could be tested for H. pylori because in 8 patients with oesophageal cancer the scope could not be safely passed into the stomach to obtain the samples. There were 176 individuals in whom it could be safely passed, there were 75.6% H. pylori positive and 24.4% negative.

### Discussion

There are multiple reasons patients present with upper gastrointestinal symptoms but epigastric pain is the most common reason for endoscopy. In this study the complaint of epigastric pain (51.6%) was the most common reason for endoscopy similar to studies in Jos and Ilorin, Nigeria<sup>9,10</sup>

The most common identifiable lesion at endoscopy in our study was gastritis (40.2%) which is similar to the data from Kenya, and Sudan. These earlier studies in Kenya and Sudan showed a frequency of gastritis at 25.8% and 36.9% respectively.<sup>11,12</sup> This disparity may be as a result of the difference in predisposition to risk factors for gastritis among the patients who were studied in these countries.

In this study endoscopy was normal in 15.2% which is similar to data from Kano, Nigeria.<sup>13</sup> However there were significant differences in endoscopic findings based on the individual's age in our study. The most common finding on endoscopy was normal tissue in patients younger than 40 years. However, in patients older than 40 years only 2 out of 110 patients had normal endoscopic findings. Thus if a patient presents with upper gastrointestinal symptoms and is older than 40 years there is a very high likelihood of finding significant pathology.

Individuals who present with symptoms and who are over 40 years old have a significant risk of malignancy in our setting. Of the 110 patients over 40 years old 38 (34.5%) were found to have either esophageal or gastric cancer. Our incidence of cancer is higher than what has been reported in earlier studies conducted in Nigeria and Sudan for esophageal cancer at 10.7% and 5.9% respectively and while gastric cancer 3.5% to 6.6%.<sup>9,12,14</sup> It is not completely clear why there is disparity between our study and the Nigerian and Sudanese data but perhaps the differences could be related to the age of patients studied or the increasing incidence of gastrointestinal cancers.

*H. pylori* was diagnosed in 75.6% among the biopsied patients and this is consistent with results of various studies done in Africa that have shown a high prevalence of *H. pylori*. In Ghana and Rwanda studies conducted found the *H. pylori* at a prevalence of 75% using urease test for all biopsies.<sup>15,16</sup> Previous studies conducted in various parts of South-Western Nigeria where patients were investigated for *H. pylori* with the use of (CLO) test showed prevalence rates of 60.5% to 73%.<sup>17-19</sup> In addition this study showed that 51.9% of the patients with gastritis had *H. pylori* infection (P-value<0.001) which is consistent with previous studies in Kenya and Nigeria.<sup>17,20,21</sup>

As expected almost all patients with gastric and duodenal ulcer were infected with *H. pylori*. This finding corroborates the results from similar studies conducted in Nigeria and other parts of Africa.<sup>21-23</sup> It was also noted that 11 out of 28 patients with normal endoscopy findings were positive for *H. pylori*.

### Limitations

These include the following: first, the fact that it's a single institution hospital based study which may not be a true representation of the burden of upper gastrointestinal diseases of whole population in this region since economic factors influence health-seeking behavior of patients. Secondly we did not specifically exclude patients who had used proton-pump inhibitors in the two weeks or bismuth containing drugs and antibiotics in the 4 weeks preceding the endoscopy and *H. pylori* testing. Hence, we were unable to assess the association of these variables with *H. pylori* results. Furthermore we only used a rapid urease test to determine *H. pylori* status as compared to a combination of two or more methods to improve the accuracy of *H. pylori* detection.<sup>24</sup>

### Conclusion

Gastritis, peptic ulcer disease and upper gastrointestinal malignancies are common upper gastrointestinal diseases in South-Western Ugandans presenting with upper gastrointestinal symptoms for endoscopy and there is high prevalence of *Helicobacter pylori* associated with these diseases (p-values< 0.05).

Patients above 40 years old presenting with upper gastrointestinal symptoms are likely to have significant findings at endoscopy including esophageal or gastric malignancies, ulcerations as well as gastritis. Future studies are needed to evaluate if empiric eradication for *Helicobacter pylori* in the patients who are less than 40 would lead to a decrease in gastritis, ulcers, and malignancy in a Ugandan population. In addition perhaps the healing of these conditions would decrease the need for endoscopy especially in a resource limited setting such as South-Western Uganda.

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### Declaration of conflicting interests

The authors declare that there is no conflict of interest.

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