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Oesophagogastroduodenoscopy in a tertiary healthcare facility in south-west Nigeria–a five year review of the spectrum of indications and endoscopic abnormalities

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Abstract
Background: Complaints of upper gastrointestinal symptoms are common in everyday clinical practice; the underlying aetiology varies widely. Oesophagogastroduodenoscopy (OGD) is the gold standard investigation for evaluating upper gastrointestinal symptoms. It is very useful in the proper diagnosis and determination of the appropriate treatment, including endotherapy, of the underlying pathology.
Aim/Objective: To determine the spectrum of indications and endoscopic abnormalities in the patients undergoing Oesophagogastroduodenoscopy at a tertiary healthcare facility located in a rural community in south-west Nigeria.
Methods:
This was a retrospective cohort study of all patients who had Oesophagogastroduodenoscopy between February 2016 and February 2021 (a period of 5 years). The Age, Gender, Indication and the Endoscopy findings were obtained from the endoscopy register. A total of 208 Oesophagogastroduodenoscopies had been performed over the period. The data obtained was analyzed using the Statistical Package for the Social Sciences (SPSS) version 21.0. Descriptive statistics used included frequency tables, means and standard deviations.
Results: A total number of 208 Oesophagogastroduodenoscopies were performed during the period under review, out of which 109 (52.4%) were males and 99 (47.6%) were females with a male to female ratio of 1.1 to 1. The age range of the patients was 9 to 89 years with a mean (±SD) of 52.4(±16.8) years and median of 52.5 years. The highest number of Oesophagogastroduodenoscopies were performed on individuals within the age bracket of 50-59 years whom were mostly females.
Dyspepsia was the most common indication for Oesophagogastroduodenoscopy (49.5%) followed by symptoms of upper gastrointestinal bleeding (haematemesis/melaena) 17.9%, unexplained persistent vomiting 6.2%, clinical suspicion of a gastric tumour 6.2% and heartburn 5.3%.
The commonest endoscopic abnormality detected from this study was Gastritis 25.5% followed by Gastric erosions 12.5%, Duodenal ulcers 8.7%, Gastric tumours 8.7% and Oesophagitis 6.7%. Normal endoscopy findings were found in 25.0% of the patients. Gastritis was also the commonest endoscopic abnormality (constituting 38.8%) in patients who had Oesophagogastroduodenoscopy done on account of dyspepsia followed by Duodenal ulcers (8.7%) and Gastric erosions (6.8%). Gastric erosions constituted the commonest cause of upper gastrointestinal bleeding in this study (43.2%) followed by Duodenal ulcers (13.5%), Gastric ulcers (10.8%) and Duodenal erosions (10.8%).
Conclusion: The commonest indication for Oesophagogastroduodenoscopy in this study was dyspepsia while the commonest endoscopic abnormality was gastritis. Gastric erosion was the most common cause of upper gastrointestinal bleeding. It may therefore be concluded that, Acid-Peptic disorders were the most common underlying gastrointestinal pathologies of patients' symptomatology necessitating endoscopic evaluation. Certainly, the importance of Oesophagogastroduodenoscopy in the evaluation of patients with upper gastrointestinal symptoms cannot be overemphasized.

Keywords: oesophagogastroduodenoscopy, endoscopy, gastrointestinal, indications, findings, Nigeria

Introduction

Oesophagogastroduodenoscopy (OGD) also known as Upper gastrointestinal endoscopy is an endoscopic procedure in which a small flexible endoscope is introduced through the mouth and advanced through the pharynx, esophagus, stomach, and the duodenum [1]. Oesophagogastroduodenoscopy is the gold standard investigation for evaluating upper gastrointestinal symptoms [2]. It provides an additional benefit of enabling mucosal biopsy sampling and brush cytology for histopathologic diagnosis and therapeutic interventions can also be carried out [1, 3].

Some indications for Oesophagogastroduodenoscopy include: Diagnostic evaluation for signs or symptoms suggestive of upper gastrointestinal (GI) disease (such as dyspepsia, dysphagia, noncardiac chest pain, or recurrent emesis); Surveillance for upper GI cancer in high-risk settings (such as Barrett esophagus or polyposis syndromes); Biopsy for suspected upper GI disease (such as malabsorption syndromes, neoplasms, or infections); and Therapeutic intervention (such as retrieval of foreign bodies, control of hemorrhage, dilatation or stenting of stricture, ablation of neoplasms, or gastrostomy placement) [1, 4].

Symptoms of upper gastrointestinal diseases are common and accurate diagnosis is usually made after an adequate clinical, laboratory and imaging assessment.[3] In resource poor countries such as in Nigeria, diagnosis is often largely based on clinical assessment [3] Accurate localization and diagnosis of gastrointestinal pathologies is necessary for proper treatment and follow-up of patients. The importance

of Oesophagogastroduodenoscopy in patient management thus cannot be overemphasized.

Several studies have been published in the literature internationally on the findings at Oesophagogastroduodenoscopy in patients presenting with symptoms of upper gastrointestinal diseases.[5-8] Some of the findings include gastritis, duodenitis, oesophagitis, gastric ulcers, duodenal ulcers, gastric masses, hiatus hernia, oesophageal candidiasis, gastro-esophageal varices, oesophageal ulcers, oesophageal stenosis, worms in the duodenum, gastric erosions, foreign body in oesophagus, oesophageal masses, gastric outlet obstruction and gastric vascular malformations with varying prevalences in different study populations [5-8]. Some studies have also reported Normal findings at Oesophagogastroduodenoscopy despite the patients having upper gastrointestinal symptoms [5-8].

Studies conducted in Nigeria have also shown similar findings with varying prevalences [9-19]. There is however paucity of data on the pattern of endoscopy findings in patients undergoing Oesophagogastroduodenoscopy in the rural environments in Nigeria. This is because endoscopy services are not available in most rural communities in Nigeria and the few published studies were conducted in urban communities where endoscopy is available. This is sadly the trend across the country and also in other developing countries [5, 9, 10, 14].

The aim of this study is to determine the characteristics of the patients undergoing Oesophagogastroduodenoscopy in a rural community in south-west Nigeria. The objective of this study is to determine the spectrum of indications and endoscopic abnormalities in the patients undergoing Oesophagogastroduodenoscopy at the Federal Teaching Hospital, Ido-Ekiti, Ekiti state in south-west Nigeria. The institution started offering upper gastrointestinal endoscopy services in February 2016 till date and this study is an audit of the endoscopy practice.

Knowledge of the common indications for and findings at Oesophagogastroduodenoscopy in our environment will help to improve clinical practice and overall patient care. This study will also provide much needed scientific data on the subject among rural dwellers and it will contribute to the pool of the already available data which can be used to build a national database on endoscopy findings across the different communities in Nigeria. This can then form a template upon which more extensive research can be carried out in our population and can also be used for the development of a national endoscopy guideline.

Methodology

Study design

This was a retrospective cohort study of all patients who had Oesophagogastroduodenoscopy between February 2016 and February 2021 (a period of 5 years) at the Federal Teaching Hospital, Ido-Ekiti, Ekiti state in south-west Nigeria.

Study location

The study was conducted at the Federal Teaching Hospital, Ido-Ekiti, Ekiti state in south-west Nigeria. Ido-Ekiti is one of the rural communities located in Ido-Osi local government area of Ekiti state which has an estimated population of 159,114 people. The Federal Teaching Hospital, Ido-Ekiti is a tertiary health institution that started providing endoscopy services for patients since February 2016 till date.

The Oesophagogastroduodenoscopies were carried out in the endoscopy suite which is located within the Operating Theatre complex of the Federal Teaching Hospital, Ido-Ekiti. The Gastroenterology unit of the Department of Medicine is in charge of all gastrointestinal endoscopies in the institution.

Patient population

Referrals for endoscopies are received by the Gastroenterology unit from the hospital's outpatient clinics, wards, emergency department, other various specialized units within medicine department as well as from other departments in the hospital such as Paediatrics, Obstetrics and Gynaecology, and General Surgery. The hospital runs an "open access" endoscopy policy whereby the patients are directly referred to the endoscopy room by their physicians based on their perceived need without prior review by a gastroenterologist. Nevertheless, the patients would be properly prepared for the procedure following standard protocols.

Procedure

Patients presenting for upper gastrointestinal endoscopy would have been booked and fasted for a minimum of 8hours before the procedure. The procedure was explained to them and a written informed consent obtained before the procedure. The patients' socio-demographics and indication for Oesophagogastroduodenoscopy were documented in the endoscopy register.

The oropharynx was anaesthesized with 10% Xylocaine spray and an anti-motility agent (Hyoscine butyl bromide 20mg) administered before the procedure. Occasionally, a sedative (Midazolam or Diazepam 2.5-5mg) was administered when indicated. General anaesthesia was not administered to any of the patients. With a pulse oximeter, continuous monitoring of the SpO2 and pulse rate of the patients was done by a nurse throughout the procedure.

Patients were placed in the left lateral decubitus position. A systematic examination was done by the endoscopists (a Gastroenterologist). The Oesophagogastroduodenoscopy was done using a forward viewing Olympus CV-170 series video scope (Olympus America Incorporated) according to standard procedures. Endoscopic images of important views were taken for documentation and for further review after the procedure.

Samples of mucosal biopsies were taken as indicated and the specimens were transported in a formalin solution for histopathological evaluation. There was observation of the patient for a minimum period of 30minutes after the procedure and subsequently discharged home or taken to the wards once the vital signs are satisfactory. The endoscopy findings were documented in the endoscopy register and an endoscopy report was issued to the patients.

Data collection

The endoscopy room register was used to obtain the data for a five-year period; February 2016 to February 2021. The following information was obtained from the register: Age, Gender, Indication and the Upper gastrointestinal endoscopy findings. A total of 208 Oesophagogastroduodenoscopies had been performed over this period.

Ethical Approval

Ethical approval was obtained from the Ethics and Research Committee of the institution.

Data Analysis

The data obtained was analyzed using the Statistical Package for the Social Sciences (SPSS) version 21.0 computer software package (SPSS Chicago Inc. IL U.S.A). Descriptive statistics used included frequency tables, means and standard deviations.

Results

A total number of 208 Oesophagogastroduodenoscopies (OGDs) were performed during the period under review (February 2016 to February 2021 – a five year period), out of which 109 (52.4%) were males and 99 (47.6%) were females with a male to female ratio of 1.1 to 1 (Figure 1). The age range of the patients was 9 to 89 years with a mean (±SD) of 52.4(±16.8) and median of 52.5 years (Figure 2).

The highest number of Oesophagogastroduodenoscopies were performed on individuals within the age bracket of 50-59 years whom were mostly females (Table 1). There had been a gradual rise over the years in the number of the Oesophagogastroduodenoscopies performed with 57 (27.4%) procedures performed in 2019 but declined to 31 (14.9%) procedures in 2020 (Figure 3).

Dyspepsia was the commonest indication for Oesophagogastroduodenoscopy (49.5%) followed by symptoms of upper gastrointestinal bleeding (haematemesis/ melaena) 17.9%, unexplained persistent vomiting 6.2%, clinical suspicion of a gastric tumour 6.2% and heartburn 5.3%. The other indications for Oesophagogastroduodenoscopy in this study are as shown in Table 2.

Various endoscopic abnormalities were detected in this study and some patients had multiple abnormalities (Table 3 and Figures 4-6). The commonest endoscopic abnormality detected from this study was Gastritis 25.5% followed by Gastric erosions 12.5%, Duodenal ulcers 8.7%, Gastric tumours 8.7% and Oesophagitis 6.7%. The other endoscopic abnormalities detected in this study are as shown in Table 3. Normal endoscopy findings were found in 25.0% of the patients.

In this study, it was observed that some patients with dyspepsia had multiple endoscopic abnormalities (Table 4). Gastritis was the commonest endoscopic abnormality (constituting 38.8%) in patients who had Oesophagogastroduodenoscopy done on account of dyspepsia. Duodenal ulcers (8.7%) and Gastric erosions (6.8%) were also among the endoscopic abnormalities found in this category of patients while 38.8% of them had normal endoscopy findings.

Multiple endoscopic abnormalities were also found in some patients with upper gastrointestinal bleeding (Table 5). Gastric erosions constituted the commonest cause of upper gastrointestinal bleeding in this study (43.2%) followed by Duodenal ulcers (13.5%). Gastric ulcers and Duodenal erosions were responsible for 10.8% each of the causes of upper gastrointestinal bleeding. Gastro-oesophageal varices were found in only seven (3.4%) patients in this study and three of them had variceal band ligation therapy (Figures 6-7).

Table 1: Age and Gender Distribution.

	Gender		
Age Group	Males	Females	Total (%)
< 20	5	2	7 (3.4)
20-29	8	3	11 (5.3)
30-39	17	15	32 (15.4)
40-49	21	11	32 (15.4)
50-59	22	28	50 (24.0)
60-69	15	22	37 (17.8)
70-79	19	14	33 (15.9)
80-89	2	4	6 (2.9)
≥ 90	0	0	0 (0)
Total (%)	109 (52.4)	99 (47.6)	208 (100.0)

Table 2: Indications for Oesophagogastroduodenoscopy (OGD)

Indications	**Frequency**	**%**
Dyspepsia	103	49.5
Haematemesis/Melaena	37	17.9
Unexplained Vomiting	13	6.2
Suspected Gastric Cancer	13	6.2
Heartburn/Regurgitation	11	5.3
Dysphagia	8	3.8
Unexplained Weight Loss	4	1.9
Odynophagia	4	1.9
Foreign Body in the Oesophagus	3	1.4
Oesophageal Variceal Banding	3	1.4
Epigastric Mass/Swelling	2	1.0
Acute Poisoning	2	1.0
Chronic Diarrhoea	2	1.0
Unexplained Anaemia	2	1.0
Follow-up Endoscopy	1	0.5
Total	208	100.0

Table 3: Oesophagogastroduodenoscopy findings.

Endoscopy Findings	Frequency	%
Gastritis	53	25.5
Normal Findings	52	25.0
Gastric Erosion	26	12.5
Duodenal Ulcer	18	8.7
Gastric Tumour	18	8.7
Oesophagitis	14	6.7
Gastric Outlet Obstruction	13	6.3
Gastric Ulcer	10	4.8
Duodenitis	7	3.4
Duodenal Erosion	7	3.4
Gastro-Oesophageal Reflux Disease	7	3.4
Gastro-Oesophageal Varices	6	2.9
Oesophageal Tumour	5	2.4
Portal Hypertensive Gastropathy	5	2.4
Gastric Atrophy	4	1.9
Oesophageal Stenosis/Stricture	3	1.4
Barrett's Oesophagus	3	1.4
Gastric Polyp	3	1.4
Oesophageal Ulcer	3	1.4
Duodenal Tumour	2	1.0
Oesophageal Diverticulum	2	1.0
Foreign Body in the Oesophagus	2	1.0
Hiatus Hernia	1	0.5
Oesophageal Candidiasis	1	0.5
Achalasia	1	0.5
Gastroparesis	1	0.5
Eosinophilic Oesophagitis	1	0.5
Total	268	129.1

Table 4: Endoscopy Findings in patients with Dyspepsia.

Endoscopy Findings	Frequency	%
Gastritis	40	38.8
Normal Findings	40	38.8
Duodenal Ulcer	9	8.7
Gastric Erosion	7	6.8
Oesophagitis	3	2.9
Gastric Outlet Obstruction	3	2.9
Gastric Ulcer	3	2.9
Gastric Atrophy	2	1.9
Duodenitis	2	1.9
Duodenal Erosion	2	1.9
Gastric Polyp	1	1.0
Oesophageal Diverticulum	1	1.0
Gastro-Oesophageal Reflux Disease	1	1.0
Oesophageal Ulcer	1	1.0
Total	115	111.5

Table 5: Endoscopy Findings in patients with Upper Gastrointestinal Bleeding.

Endoscopy Findings	Frequency	%
Gastric Erosion	16	43.2
Normal Findings	5	13.5
Duodenal Ulcer	5	13.5
Gastric Ulcer	4	10.8
Duodenal Erosion	4	10.8
Gastro-Oesophageal Varices	3	8.1
Gastritis	3	8.1
Portal Hypertensive Gastropathy	3	8.1
Gastric Tumour	3	8.1
Gastric Outlet Obstruction	2	5.4
Gastric Atrophy	1	2.7
Gastric Polyp	1	2.7
Total	50	135

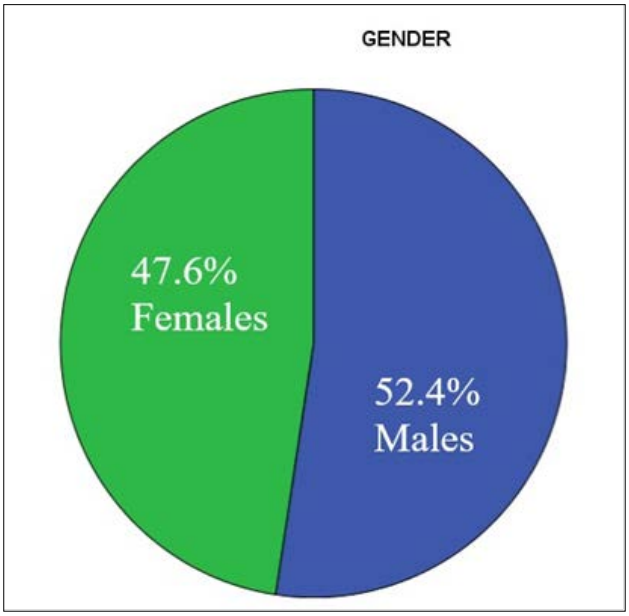

Fig 1: Gender Distribution

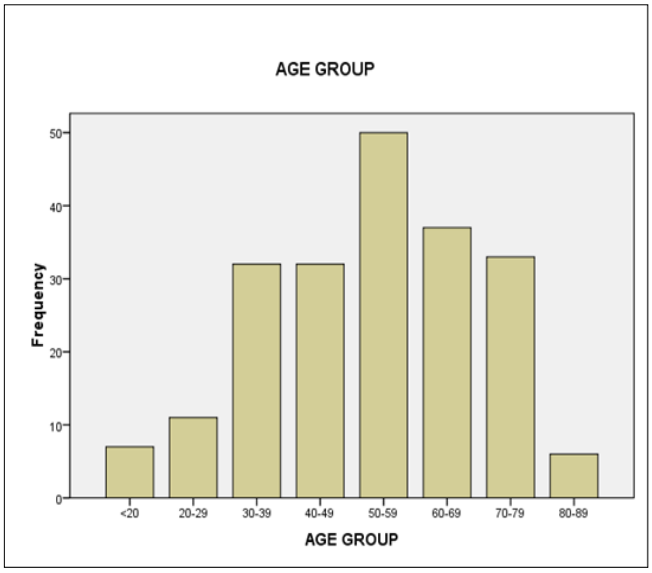

Fig 2: Age group distribution.

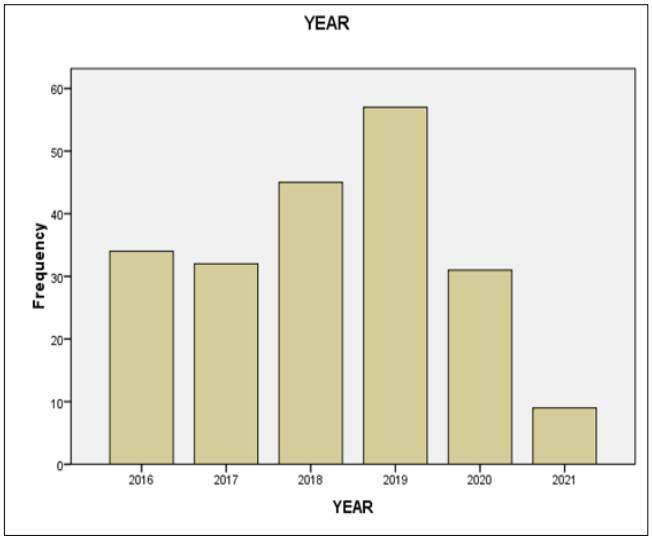

Fig 3: Frequency of Oesophagogastroduodenoscopies over a five-year period (Feb. 2016 to Feb. 2021).

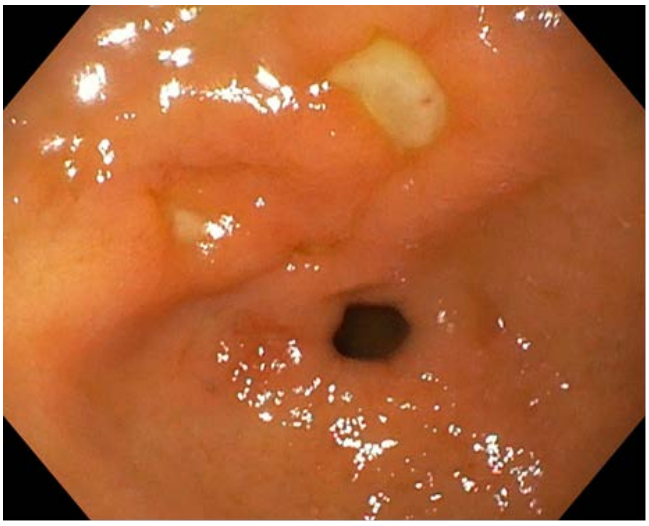

Fig 4: Endoscopic image of a Gastric Antral ulcer in a patient presenting with dyspepsia.

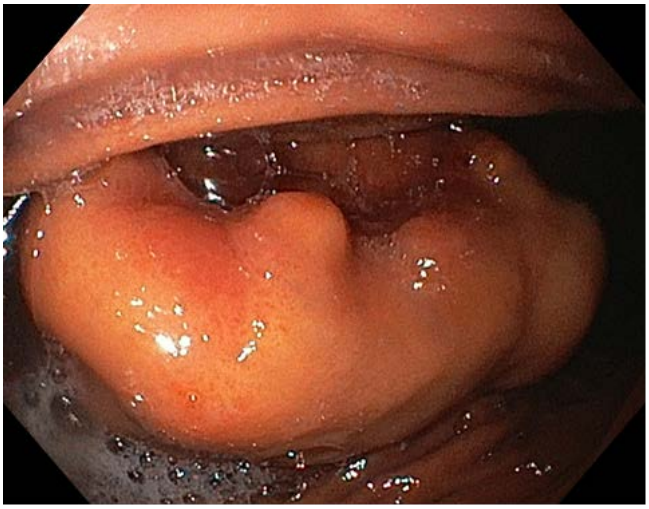

Fig 5: Endoscopic image of a tumour in the Gastric Corpus of a patient presenting with unexplained weight loss.

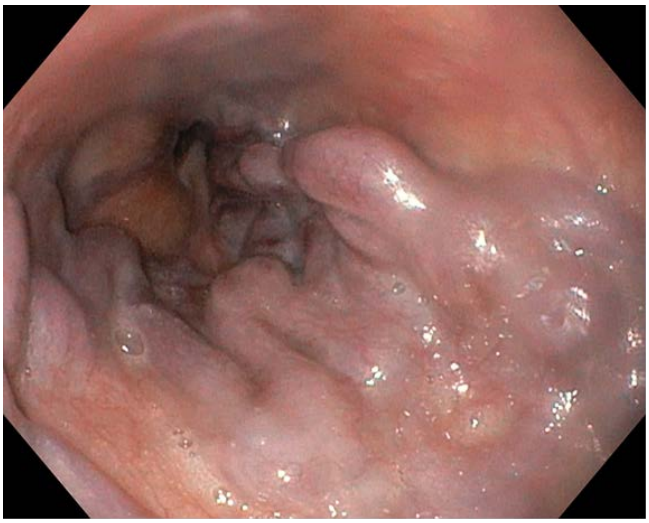

Fig 6: Endoscopic image of oesophageal varices in a patient with portal hypertension secondary to liver cirrhosis.

Discussion

Patients presenting with symptoms of upper gastrointestinal disorders are commonly encountered in routine clinical practice and oesophagogastroduodenoscopy can play a major role in the diagnosis of the underlying pathology [2, 3]. It is therefore expected that a large number of Oesophagogastroduodenoscopies would be performed as a result. In this study, the total number of Oesophagogastroduodenoscopies performed over a 5-year period was quite small when compared with similar studies in Nigeria but which were conducted in urban communities [9-19].

Although there was an initial increase in the number of Oesophagogastroduodenoscopies performed from 34(16.3%) in 2016 to 57(27.4%) in 2019, this trend changed in 2020 with only 31 (14.9%) procedures performed in that year. Overall, the number of Oesophagogastroduodenoscopy procedures performed remain relatively small. This could be due to a number of reasons which include the fact that the hospital is located in a rural environment which has a small population compared to an urban community. Also, the low educational status of the populace and their preference of traditional remedies to orthodox treatment are contributory.

The low socio-economic status of the residents, whom are mostly retirees and elderly, also prevents them from patronizing the hospital considering the high cost of services and treatment which they cannot afford. A large proportion of the residents are also self-employed; artisans, farmers and traders, and they are not registered under the National Health Insurance Scheme which could have considerably reduced the cost of accessing an upper gastrointestinal endoscopy service in the hospital.

Furthermore, the COVID-19 pandemic also contributed to the decline recorded in the number of the Oesophagogastroduodenoscopy procedures performed in the year 2020 otherwise more procedures should have been recorded than that of 2019 going by the upward trend in the number procedures performed before the pandemic.

This study found a male: female ratio of 1.1:1 among patients who had Oesophagogastroduodenoscopy. This is similar to the finding of Picardo *et al.* [18]. in Abakaliki and Mustapha *et al.* [14] in Maiduguri. Ray-Offor *et al.* [3] in Port Harcourt, Jeje *et al.* [16]in Lagos and Dambauchi *et al.* [10] in Zaria had a male preponderance in their patients while Olokoba *et al.* [20] in Ilorin, Gyedu *et al.* [21] in Kumasi and Al-Romaih *et al.* [22] in Saudi Arabia had more females in their study.

In this study, the mean (±SD) age of the patients is 52.4(±16.8) years while studies by Malu *et al.* [9] in Zaria, Jeje *et al.* [16] in Lagos and Ray-Offor *et al.* [3] in Port Harcourt had much younger patients with the mean age of 32 years, 42.2 years, and 46.4 years respectively. Sixty percent of the patients in this study were above 50 years of age; reflecting the age when majority of the population would likely require an Oesophagogastroduodenoscopy. The age difference may be because the setting of this study was a rural community with a lot of retirees and elderly individuals unlike the other studies which were conducted in urban communities with much younger population.

The commonest indication for Oesophagogastroduodenoscopy in this study was dyspepsia (49.5%) followed by upper gastrointestinal bleeding (17.9%). This is in keeping with the findings in similar studies across Nigeria, Africa [21, 23, 24] and the world [22]. Malu *et al.* [9]. In Zaria, North Central, Nigeria found dyspepsia as the commonest indication for the procedure amongst their patients which was also followed by the upper gastrointestinal bleeding. Danbauchi *et al.* [18] also in Zaria,

some years later still found dyspepsia as the commonest indication for the procedure. Agbakwuru *et al.* [18] in Ile-Ife, South-West, Nigeria, also found dyspepsia as the commonest indication for Oesophagogastroduodenoscopy amongst their patients. Onyekwere *et al.* [18] in Lagos, also in South-West of Nigeria found dyspepsia and upper gastrointestinal bleeding as the commonest indications for Oesophagogastroduodenoscopy in their patients.

Dyspepsia and upper gastrointestinal bleeding were also the commonest indications for Oesophagogastroduodenoscopies in the North East and Middle belt regions of Nigeria as reported by Mustapha *et al.* [18] and Olokoba *et al.* [15]. respectively. Picardo *et al.* [18] in Abakaliki, South-East Nigeria also reported in their study that the commonest indication for the Oesophagogastroduodenoscopies was dyspepsia followed by upper gastrointestinal bleeding.

The commonest endoscopic abnormality in this study was gastritis (25.5%) followed by gastric erosion (12.5%). Among the patients with dyspepsia, gastritis and duodenal ulcers were the most common endoscopic abnormalities while among the patients with upper gastrointestinal bleeding, gastric erosions and duodenal ulcers were the most common endoscopic abnormalities. Danbauchi *et al.* [10]. reported gastritis and duodenitis as their most frequent endoscopic findings. They also reported more cases of duodenal ulcers than gastric ulcers in their patients. In this study, duodenal ulcers were also found more frequently than gastric ulcers and this is in keeping with the findings of other similar studies in Nigeria [10, 12, 16].

Acute gastritis followed by duodenal ulcer and reflux esophagitis were the most frequent endoscopic findings by Agbakwuru *et al.* [10]. The commonest findings by Onyekwere *et al.* [10]. in their patients were gastroesophageal reflux disease, gastroduodenitis, and peptic ulcer disease. They noted that varices were uncommon in their patients which is similar to the findings in this study. Gastro-oesophageal varices were found in only seven (3.4%) patients in this study and three of them had variceal band ligation therapy. In contrast, Malu *et al.* [9]. reported in their study that oesophageal varices were commoner than peptic ulcer disease in patients who presented with upper gastrointestinal bleeding. Picardo *et al.* [18]. also reported gastritis as the commonest endoscopic diagnosis in their study. They reported in addition that peptic ulcers were seen more commonly than gastro-oesophageal varices in patients presenting with upper gastrointestinal bleeding.

Conditions whose pathophysiology is believed to be the result of mucosal damage from acid and peptic activity of gastric secretions are referred to as acid peptic disorders [25]. They include Gastritis, Duodenitis, Gastric erosion, Duodenal erosion, Oesophagitis, Gastroduodenitis, Gastric ulcer, Duodenal ulcer, Gastroesophageal reflux disease, Zollinger-Ellison syndrome and Stress-related ulcers [25]. In this environment, the common risk factors for acid peptic disorders include use of non-steroidal anti-inflammatory drugs (NSAIDS), consumption of herbs and other toxic substances, excessive alcohol consumption, indiscriminate use of unprescribed or over the counter medications and *Helicobacter pylori* infection among others [25].

Pathological conditions associated with *Helicobacter pylori* infection include chronic gastritis, duodenal ulcers, gastric ulcers, gastric adenocarcinoma and gastric mucosal associated lymphoid tissue (MALT) lymphoma [26]. The prevalence of *Helicobacter pylori* infection is high in Nigeria [27]. Jemilohun *et al.* [28]. reported a prevalence of 64% among patients with dyspepsia in Ibadan, Nigeria while Solomon *et al.* [29]. reported a prevalence of 76% in Ekiti, Nigeria. The prevalence of *Helicobacter pylori* infection has been documented in the literature to be high in developing countries, and associated with low levels of education, low social economic status, dwelling in a rural environment and poor sanitation [27, 30].In this study, the patient population were prone to all these risk factors and that may explain the high prevalence of the dyspepsia and upper gastrointestinal bleeding amongst them; with endoscopic confirmation of high prevalence of gastritis and gastric erosions among others.

Gastric cancer has a low prevalence in sub-Saharan Africa with the lowest incidence rates in Western Africa [31, 32]. In this study, Gastric tumours constituted 8.7% of the endoscopic abnormalities identified; this is higher than what was reported by similar studies in Nigeria (1.1–6.0%).[32, 33]. Picardo *et al.* [18]. reported that gastric masses represented 4.3% of their endoscopic findings while Jeje *et al.* [16]. reported 5.7% cases of gastric cancers in their study.

The mean age of the patients with gastric tumours in this study was 61.0±16.77 years which is higher than the mean age at diagnosis in Nigeria (56years) [32, 34, 35] but lower than the median age at diagnosis in the United States (68years) [36]. It is known, just as it is with many other cancers, that the incidence of gastric cancer increases with age and the difference in the age at diagnosis observed in this study could be because the study patients are from a rural community in which a significant proportion are elderly.

In Nigeria and sub-Saharan Africa, most patients present with advanced disease often complicated by gastric outlet obstruction, bleeding or perforation [34, 37]. These complications were also observed in the patients in this study. This pattern of late presentation could be because early gastric cancer has no specific symptoms, most symptoms of gastric cancer such as early satiety, unexplained persistent vomiting, unexplained weight loss and epigastric swelling all reflect advanced disease [38].

This study has shown an overall diagnostic yield of 75.0% with 25.0% having normal endoscopic findings at Oesophagogastroduodenoscopy. Picardo *et al.*[18] reported a diagnostic yield of 87.2% in their study while Ray-Offor *et al.*[3] and Jeje *et al.*[16] reported diagnostic yields of 90% and 66.3% respectively. Differences in indications, as well as the spectrum of upper GI diseases, inclusion criteria and sample size are some of the factors that can determine the diagnostic yield following Oesophagogastroduodenoscopy.

Studies have shown that the highest diagnostic yield is found in patients having upper GI bleeding [13, 10, 15]. This observation was also supported by this study in which 86.5% of the patients with upper gastrointestinal bleeding had an identifiable endoscopic abnormality that is responsible for the bleeding (i.e. 86.5% diagnostic yield) while in 13.5% of the patients, there was no endoscopic abnormality found. The importance of Oesophagogastroduodenoscopy in the evaluation of patients with upper gastrointestinal symptoms, in order to confirm the diagnosis and in some cases provide therapy, thus cannot be overemphasized.

Limitations of the study

1. The total number of the oesophagogastroduodenoscopies performed over the 5-

year period under review was relatively small, a larger volume of the procedure would have been better which could give a wider range of endoscopic abnormalities.
2. The histology reports of the mucosal biopsy samples taken during the endoscopy procedures were not documented in the Endoscopy register and thus was not included in this study. Since the hospital does not have Electronic Medical Record, such reports can only be retrieved by searching through the individual case files of the patients which is outside the scope of this study.

Conclusion

The commonest indication for Oesophagogastroduodenoscopy in this study was dyspepsia while the commonest endoscopic abnormality was gastritis. Gastric erosion was the most common cause of upper gastrointestinal bleeding. It may therefore be concluded that, Acid-Peptic disorders therefore are the commonest underlying gastrointestinal pathologies of patients' symptomatology necessitating endoscopic evaluation. Certainly, the importance of Oesophagogastroduodenoscopy in the evaluation of patients with upper gastrointestinal symptoms cannot be overemphasized.

The findings from this study conducted in a rural community in Nigeria were similar to those conducted in urban communities in the country; suggesting that place of domicile may not affect the pattern of symptomatology, clinical presentation or the endoscopy findings of individuals. This further suggests that the risk factors of the various gastrointestinal pathologies are similar in both rural and urban communities. Therefore, a national guideline on the endoscopic evaluation of upper gastrointestinal disorders can be universally applied irrespective of the location of practice in Nigeria.

Recommendations

1. Enlightenment of the public about the need to avoid the risk factors for acid peptic disorders is important in reducing its incidence in the general population. Such risk factors include use of non-steroidal anti-inflammatory drugs (NSAIDS), excessive alcohol consumption, consumption of herbs and other toxic substances and indiscriminate use of unprescribed or over the counter medications. There is also a need to test and treat for Helicobacter pylori infection in individuals with dyspepsia in order to prevent its sequelae and to reduce the transmission and burden of this infection among the populace thereby reducing the morbidity and mortality associated with it.
2. Oesophagogastroduodenoscopy can offer early detection, treatment and surveillance for gastric cancers. There is a need for a national guideline in Nigeria as regards the age to commence screening endoscopy for early detection of premalignant lesions and early gastric cancers.
3. Government should ensure universal health insurance coverage for the populace, which should cover upper gastrointestinal endoscopy so that more patients with the indications for it can benefit from the procedure. This would increase the volume of the procedures performed, improve the skills of the endoscopists, enhance better training of resident doctors and improve overall patient care.
4. Government should also make endoscopy services available in more health institutions across the country including rural communities to facilitate patients' access to care.
5. Regular Clinical Audit should be performed by each specialized unit in the hospital and compare practice with international standards; this would greatly improve overall performance and patient care.

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