International Research Journal of Medical Sciences _____ISSN 2320 – 7353
Vol. **13(2),** 1-7, August **(2025)** *Int. Res. J. Medical Sci.*

Upper Gastrointestinal Endoscopy findings and associations with Helicobacter Pylori diagnosis in an open access Endoscopy setting in South-West Nigeria

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Available online at: www.isca.in
Received 18th February 2025, revised 14th March 2025, accepted 28th May 2025

Abstract

Access to upper gastrointestinal endoscopy is slowly but steadily improving in sub-Saharan Africa and it is important to record findings periodically especially as they relate to Helicobacter pylori which is causative for many gastro duodenal diseases. This will help in charting an appropriate policy framework to mitigate the effect of these diseases. The study was undertaken to document the findings on upper gastrointestinal endoscopy and associations with Helicobacter pylori (H. pylori) in Nigerians presenting for gastroscopy in an open access setting in South-West Nigeria. Ethical approval for the study was obtained from the University of Medical Sciences Research Ethics Committee with number NHREC/TR/UNIMED-HREC-Ondo St/22/06/21. A retrospective analysis of the endoscopic database of 533 consecutive patients who had gastro copy in an open access endoscopy setting in South-West Nigeria over three years. The patients' characteristics, endoscopic diagnoses and H. pylori status (by histology) were analysed. The overall H. pylori positivity rate was 48% (n=106), similar to that found elsewhere in sub-Saharan Africa. Common endoscopic diagnoses included gastritis (34.8%), normal findings (6.7%), gastric polyps (3.7%) and malignancy (1.7%). Gastric polyps were inversely associated with H. pylori infection (OR 0.266 [0.124–0.568]; p=0.001). Helicobacter pylori remains an important risk factor for gastrointestinal dyspepsia in Nigeria. Its association with gastric polyps should be submitted to more rigorous examination.

Keywords: Upper Gastrointestinal Endoscopy, Helicobacter pylori, Open Access, Nigeria.

Introduction

Upper gastrointestinal endoscopy is an important tool for the diagnosis of gastrointestinal diseases especially the early detection of gastric cancer[1,2]. It is minimally invasive and provides the doctor the opportunity to definitively ascertain gastrointestinal pathologies. Access to gastrointestinal endoscopy though grossly insufficient in sub-Saharan Africa, is improving, and it is crucial to improving the morbidity and mortality associated with these diseases in developing nations including Nigeria and it is important to chronicle findings[3,4].

An important advantage of endoscopy is that diagnosis of Helicobacter pylori can be made which is infinitely important as Helicobacter pylori has been implicated in the aetiopathogenesis of many gastrointestinal ailments including gastric cancer[5]. Appropriate and effective treatment can also be given which can help in reducing the morbidity and mortality of gastrointestinal ailments in our environment[6]. This is salient as H. pylori is endemic in this part of the world and plays a definitive role in many gastrointestinal diseases[7]. This study aimed to describe the spectrum of upper gastrointestinal findings in an open access setting as well as their associations with H. pylori.

Materials and Methods

The study was a retrospective, descriptive study derived from a routinely collected open access endoscopy database. The study population were patients presenting for gastroscopy at a private endoscopy setting over a 3-year period (September 2020 to September 2023). Each patient was adequately counseled on the need for upper GI endoscopy, and the procedure adequately described. The patient was made to fast for 6-8 hours. On the morning of the procedure, a written consent was taken from the patient. Dentures if present were removed. They also had 10% plain xylocaine spray applied to the pharynx before undergoing upper GI endoscopy. The patient was placed in the left lateral position and with a mouth guard in place. Conscious sedation was applied with 2.5mg of intravenous Midazolam. Patients who were intolerant of the procedure received intravenous ketamine at 0.5mg/kg bolus. Following that, the distal lubricated end of the endoscope was introduced into the mouth under direct vision.

The patient was asked to swallow and the instrument advanced through the oesophagus, into the stomach and then into the proximal duodenum. The aforementioned parts were visualised and findings recorded. Mucosal biopsies were taken from the corpus and antrum following the modified Syndey protocol.

The procedure was carried out by the principal researcher. After the procedure, the patient was taken to the recovery room and monitored. Patients were also counseled on the findings on endoscopy, their implications and further care.

Histological examination of biopsy specimens from each patient involved fixation in formalin for 24 hours before tissue processing. Sets of tissue slides were then stained with Hematoxylin-Eosin (H&E) and Giemsa, followed by microscopic analysis to morphologically identify biopsy specimens as gastric antral and corporal tissues.

The evaluation followed Sydney classification guidelines to distinguish between H. pylori positive and negative cases. Patient characteristics, indication for gastroscopy, endoscopic diagnoses and H. pylori status were documented. Ethical approval for the study was obtained from the University of Medical Sciences, Ondo State Research Ethics Committee with number NHREC/TR/UNIMED-HREC-Ondo St/22/06/21.

Patient identifiers (name, record number) were excluded on extraction of the data from the database. As the study was retrospective and observational, and involved a routinely collected hospital database, individual informed consent was not sought, in accordance with the Helsinki Declaration.

The data was entered in SPSS Version 21.0 (Chicago, IL, USA) and then double checked against the original source. All calculations were performed on a per-patient basis, with only the initial endoscopy for a patient analysed. All p values for differences between study groups were calculated using the $\chi 2$ test and were two-tailed, with significance level of $p<0.05$.

Results and Discussion

The mean age (SD) of the studied population was 51.3 (±16.9) years. There were 249 (46.7%) females and 284 (53.3%) males, with a male: female ratio of 1.1:1. Majority of the study participants were in the 41-50 age groups (23.6%).

Two hundred and eight (36.6%) had abdominal pain, 99 (17.4%) had heartburn, 93 (16.4%) had chest pain**,** 32 (5.6%) had recurrent vomiting, 26 (4.6%) had haematemesis, 24 (4.2%) had melaena, 18 (3.2%) had dysphagia, 17 (3.0%) had early satiety, 14 (2.5%) had a history of abdominal swelling, 13 (2.3%) had a history of anaemia and weight loss, 6 (1.1%) had a history of chronic liver disease, and 5 (0.9%) had a history of acid regurgitation.

Two hundred and seventy-nine (34.8%) had gastritis, 101 (11.6%) had duodenitis, 89 (10.3%) had erosive oesophagitis**,** 58 (6.7%) had normal findings, 53 (6.1%) had bile reflux gastritis, 44 (5.1%) had mucosal atrophy, 32 (3.7%) had gastric polyps, 30 (3.5%) had gastric ulcers, 28 (3.2%) had gastro-oesophageal prolapse, 25 (2.9%) had oesophageal candidiasis and oesophageal varices, 14 (1.6%) had duodenal polyps, 13 (1.4%) had gastric cancer, 10 (1.1%) had portal hypertensive gastropathy, 7 (0.8%) had duodenal ulcers, 5 (0.6%) had gastric outlet obstruction, 4 (0.4%) had oesophageal polyp, 2 (0.2%) had both gastric varices and oesophageal cancer while 1 (0.1%) had both Cameron lesion and duodenal cancer.

The age group 41-50 had the highest frequency of gastric cancer (4, 30.8%); age group 61-70 had 3 (23.1%) age groups 51-60 and 81-90 had 2 each (15.4%) while age groups 71-80 and 91-100 had 1 (7.7%) each.

One hundred and six (48%) of therecruited subjects were positive for Helicobacter pylori while 114 (52%) subjects were negative for *H. pylori*.

Only gastric polyps had a significant relationship with *H. pylori*.

Table-1: Socio-demographic characteristics of the study subjects.

Variable Age group (in years)	Frequency(n)
20-Nov	11
21-30	39
31-40s	82
41-50	126
51-60	98
61-70	97
71-80	48
81-90	25
91-100	7
Mean ± SD	51.3 ± 16.9
Range	14 - 95
Gender	
Female	249
Male	284

Table-2: Clinical features.

Symptom	Frequency(n)	Percentage(%)
Abdominal pain	208	36.6
Heartburn	99	17.4
Chest pain	93	16.4
Recurrent vomiting	32	5.6
Haematemesis	26	4.6
Melaena	24	4.2
Dysphagia	18	3.2
Early satiety	17	3
Abdominal swelling	14	2.5
Anaemia	13	2.3
Weight loss	13	2.3
Chronic liver disease	6	1.1
Regurgitation	5	0.9

Table-3: Endoscopic findings.

Endoscopic finding	Frequency (n)	Percentage(%)
Gastritis	297	34.8
Duodenitis	101	11.6
Erosive oesophagitis	89	10.3
Normal findings	58	6.7
Bile reflux gastritis	53	6.1
Gastric mucosal atrophy	44	5.1
Gastric polyps	32	3.7
Gastric ulcers	30	3.5
Gastro-oesophageal prolapse	28	3.2
Oesophageal candidiasis	25	2.9
Oesophageal varices	25	2.9
Duodenal polyps	14	1.6
Gastric cancer	13	1.4

Table-4: Comparison of age group and gastric cancer status.

Age group	Frequency(n)	Percentage(%)
21-30	0	0
31-40	0	0
41-50	0	0
51-60	4	30.8
61-70	2	15.4
71-80	3	23.1
81-90	1	7.7
91-100	2	15.4
	1	7.7

Table-5: Comparison of endoscopic findings with Helicobacter pylori status.

	Variable	Helicobacter pylori status		χ^2	p value
		Yes	No		
		n (%)	n (%)		
Duodenal cancer	Yes	1 (100.0)	0 (0.0)	4.447	0.035*
	No	97 (84.7)	435 (15.3)		
Duodenal polyp	Yes	0 (0.0)	14 (100.0)	3.239	0.072*
	No	98 (18.9)	421 (91.1)		
Gastric polyp	Yes	13 (39.4)	20 (60.6)	26.671	0.005*
	No	85 (17.0)	414 (83.0)		
Mucosal atrophy	Yes	19 (63.3)	11 (36.7)	49.239	0.005*
	No	85 (17.0)	414 (83.0)		
Oesophageal varices	Yes	1 (4.0)	24 (96.0)	3.603	0.05*
	No	97 (19.1)	410 (80.9)		

Table-6: Logistic regression showing significant relationship between Helicobacter pylori and gastric polyps.

Variable	B	*p* value	OR	95% confidence interval	
				Lower	Upper
Duodenal cancer	22.914	1	0	0	0
Duodenal polyp	19.422	0.999	2721 15256	0	0
Gastric polyp	1.325	**0.001***	0.266	0.124	0.568
Mucosal atrophy	0.783	0.151	2.188	0.752	6.365
Oesophageal varices	1.563	0.129	4.774	0.633	35.987

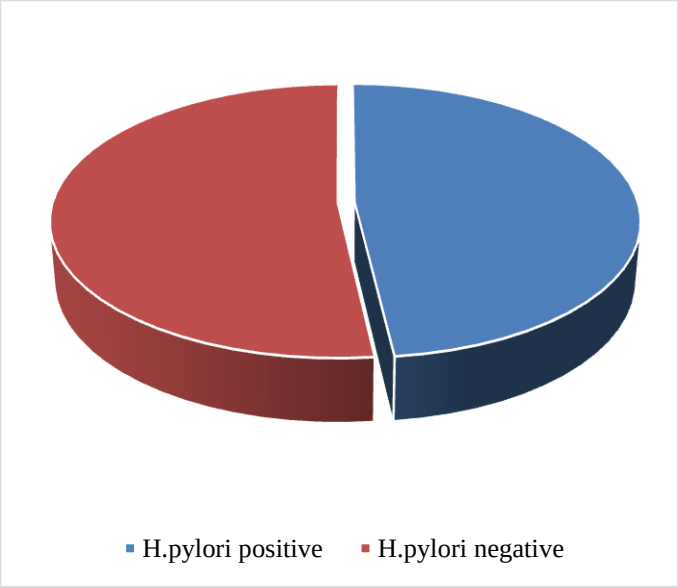

Figure-1: Distribution of study subjects with respect to Helicobacter pylori status.

Discussion: This study aimed at describing the pattern of upper gastrointestinal findings and consequently the associations with Helicobacter pylori in an open access endoscopy setting in South-West Nigeria. A recent study has shown that there is a high rate of appropriate referrals for gastroscopy in an open access setting in Nigeria[8]. This is important as this ensures that procedures are done in a timely and efficient manner given the immense need for endoscopy in the diagnosis of gastrointestinal diseases[9]. It is also thought to reduce the costs accessing healthcare by eliminating unnecessary prior office consultations[9]. In this study, majority of the patients were between the ages 41-50 years which is identical to what is obtained in other studies done in low- and medium-income countries[10–13].

The average age (51.3 ± 16 years) in this study was similar to that by Olokoba et al that is 48.1 ± 16 years[14]. This is at variance with a study done in Ethiopia in which the median age was 37 years[15]. Another significant difference in the Ethiopian study is that the commonest lesion seen was oesophageal varices which is not in tandem to the usual modal finding of gastritis as seen in most studies on findings on upper gastrointestinal endoscopy[16]. Males were more common than females as observed by other studies.[10,12,17]. A possible reason for this is the fact that women may be embarrassed on account of exposure for the procedure[17]. This is however at variance with other studies that show a female predominance[14,16].

The commonest indication for endoscopy was abdominal pain similar to that seen in a Nigerian study as well as other studies conducted in other parts of Africa (Central and Eastern) and Asia[10,12,18,19]. It has been clearly shown that early endoscopy for abdominal pain showed a small advantage in symptom control at 1 year in the endoscopy group (RR 0.95, 95% CI: 0.95–0.99) compared to the cohort that didn't have immediate endoscopy. The higher costs were however prohibitory[20]. Of course, most of the patients with abdominal pain in this index study satisfied the criteria for endoscopy as they had unremitting symptoms despite been on an adequate therapy of PPIs[1].

Screening for oesophageal varices was done in only 6 patients which represented only 1.1% of the total population. The fact that many patients with chronic liver disease do not frequently present for screening endoscopy has been noted in previous studies[11]. The small number is probably reflective of the fact most patients with chronic liver are unable to afford endoscopy for proper evaluation and treatment. This has been highlighted in the studies that show the closely knitted relationship hepatitis B related chronic liver disease and poverty share[21]. Another reason is that many health care providers are not aware for the need for screening endoscopy to combat the scourge of variceal bleeding[22].

The commonest endoscopic finding was gastritis (34.7%). Similar findings were noted in North-Central Nigeria[16] as well as in Ghana[13] Normal findings constituted 6.7% which was similar to that observed in a study done in Nigeria[11]. This substantiates the fact that functional dyspepsia remains is a relevant diagnostic consideration in patients who present with features of acid peptic disease.

Erosive oesophagitis had a higher frequency compared to many other findings in this study (89; 10.3%). It has been well described as a common finding in patients presenting with dyspepsia in developed countries[24,25]. It has also been described in sub-Saharan Africa[26]. Possible reasons adduced include the rising obesity epidemic, advancing age, changes in diet and sedentary lifestyle[27]. Bile reflux gastritis was seen in 53 (6.1%) of study subjects. This puts patients at risk for gastric cancer as many studies have shown a significant relationship with metaplastic gastritis[28].

This entity has been mostly described in Asian and European populations[29,30] and it is important to recognize that it can add to the morbidity of precancerous and cancerous gastrointestinal lesions. Upper gastrointestinal cancer (oesophagus, stomach and duodenum) accounted for approximately 1.7% of all diagnoses. This was much lower than that described by Bhat et al (>10%)[31]. The 41-50 year range has the highest frequency of gastric cancer which is keeping with suspicion that gastric cancer occurs earlier in the African population and further solidifies the proposal that screening endoscopies be conducted much earlier to mitigate the morbidity and mortality of these cancers as they are mostly diagnosed currently at advanced stages[32].

The prevalence of Helicobacter pylori in this study was 48%. This is similar to that found by Bojuwoye et al[16]. Given that histology was utilised which is described as the gold standard for direct bacilli detection, the validity of this study is reinforced. An important drawback of this study's estimate is the acknowledgement that though histology is good for making diagnosis, it has less than optimum sensitivity[33,34]. This may be responsible for lower frequency observed in this study as compared to other studies. However, a systemic analysis and meta-analysis suggests that the global prevalence of H. pylori (43.1%) is close to the value obtained in this study and this has been attributed to an improvement in general hygiene conditions, which resulted in improved household hygiene, increased availability of clean water, and better sewage treatment even in developing nations[35]. Another consideration is the fact that on account of the retrospective nature of the study, the patient's history of antibiotic use which could affect H. pylori positivity was not assessed[36].

The reduced frequency of complications of H. pylori such as peptic ulceration and gastric cancer is in keeping with the African enigma hypothesis which explains the paradox of low complications of H. pylori in endemic regions. The possible explanations suggested include nonatrophic gastritis pattern in Africa; the archetypal hpAfrica 2 type strain largely restricted in South Africa, which lacks cag A pathogenicity island; and lastly intestinal parasitic infestation modulating the immune response against H. pylori toward a Th2 type (anti-inflammatory), which may reduce risk of gastric cancer[37]. The highest frequency of H. pylori was found amongst the 41–50-year-old group. This is similar to what was found by Lai et al with the prevalence peak at 45-50 years. It is thought that maximal levels of socialisation and interaction occur at this time leading to increased transmission of H pylori[38]. There was also a noticeable decline in the frequency of H. pylori infection with aging. This observation has been noticed previously and the suggestion has been H. pylori could have been present in a small number or low activation which might not have been detected. There is also the theory that H. pylori could have been present in the past but was eliminated on account of the development of an unfavourable gastric environment with age[39].

On multivariate analysis, H. pylori was found to be negatively associated with gastric polyps which is an interesting phenomenon. This is in tandem with an African study suggests that there is an inverse relationship between helicobacter infection and proliferation of hyperplastic gastric polyps[40,41]. This finding has also been corroborated in studies done in other continents, namely Asia and America[42,43]. No plausible reason has been adduced though it has been suggested that the increased prevalence of hyperplastic polyps is caused by intestinal metaplasia of gastric mucosa, rather than the decreased prevalence of the infection[42]. Other studies contradict the findings in this study as they show that polyps may regress following H. pylori eradication[43–45]. The small sample size of polyps and the fact the histology of the polyps could not be retrieved poses significant limitation to conclusions made. It is however hoped that better designed prospective longitudinal studies in the future in African patients will help to further bring clarity to this issue.

Conclusion

Helicobacter pylori remains an important risk factor for gastrointestinal dyspepsia in Nigeria. Its association with gastric polyps should be submitted to more rigorous examination.

Acknowledgements

We wish to thank the nurses who assisted in the endoscopic procedures as well as the patients who willingly submitted themselves for the endoscopic examination.

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