ORIGINAL ARTICLE

A clinical audit of endoscopy procedures in a tertiary care hospital in Pakistan

Asim Hassan[1*], Mohammad Ali[2], Zahra Iqbal[3]

Biomedica - Official Journal of University of Health Sciences, Lahore, Pakistan
Volume XX(XX):X-X
https://doi.org/10.24911/BioMedica/XXX

ABSTRACT

Background and Objective: Endoscopy is considered the gold standard for evaluating and managing gastrointestinal (GI) disorders. It serves both diagnostic and therapeutic purposes in patients presenting with upper GI symptoms. This study aimed to audit the common indications for upper GI endoscopy and their associated endoscopic findings at Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan.

Methods: This cross-sectional study was conducted on 374 patients presenting with upper GI symptoms (including dyspepsia, dysphagia, epigastric pain, and hematemesis) between January 2021 and April 2024. Patients were recruited from both inpatient and outpatient settings. Demographic and clinical data were recorded. Endoscopic findings were documented and categorized according to indication. Descriptive statistics were applied for frequency distribution. The chi-square test was used to assess associations between presenting symptoms and endoscopic findings, with a p-value < 0.05 considered statistically significant.

Results: Of the 374 patients, 62% were male, and 38% were female. Common indications included dysphagia (29%), epigastric discomfort (21%), dyspepsia (15%), hematemesis (13%), and chronic liver disease (CLD) (5%). Endoscopic findings revealed esophagitis and gastritis predominantly in dyspepsia and epigastric pain cases, variceal bleeding in CLD and hematemesis cases, and esophageal growth in most dysphagia cases. The association between presenting complaint and endoscopic diagnosis was statistically significant ($p < 0.05$).

Conclusion: Upper GI endoscopy remains an indispensable tool for accurate diagnosis in patients with persistent upper GI symptoms.

Keywords: Endoscopy, audit, dyspepsia, gastrointestinal tract.

Received: 11 December 2024 **Revised (1):** 08 March 2025 **Revised (2):** 30 March 2025 **Accepted:** 12 April 2025

Correspondence to: Asim Hassan
*Consultant Gastroenterologist and Hepatologist, Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan.
Email: dr.asimhassan86@gmail.com
Full list of author information is available at the end of the article.

Introduction

The introduction of the first fiberoptic gastroscope in 1958 marked a significant milestone in the evolution of modern endoscopic practice.[1] Since then, conventional diagnostic modalities such as barium contrast studies have largely been replaced by endoscopy due to its higher diagnostic accuracy and therapeutic capabilities.[2] Currently, upper gastrointestinal (GI) endoscopy is regarded as the most reliable modality for direct visualization of the mucosal surfaces of the esophagus, stomach, and duodenum. Continuous advancements in endoscopic technology have further expanded its role in the comprehensive evaluation and management of gastrointestinal disorders.[3]

Endoscopy plays a pivotal role in the assessment of unexplained upper GI symptoms, including persistent heartburn, dysphagia, hematemesis, and upper GI bleeding. Beyond its diagnostic utility, it facilitates histopathological confirmation through targeted biopsies, which are essential in the evaluation of conditions such as chronic gastritis, celiac disease, and suspected malignancies. Additionally, endoscopy offers a wide range of therapeutic interventions, including stricture dilatation, polypectomy, and variceal band ligation, thereby serving as both a diagnostic and interventional tool.[4-5]

Given its extensive clinical applications, systematic audits of endoscopic practice are crucial for identifying prevailing indications, disease patterns, and clinical outcomes across different populations. Such evaluations contribute to optimizing clinical decision-making and resource utilization. Therefore, the present study was conducted to analyze the indications, findings, diagnostic yield, and therapeutic interventions associated with upper GI endoscopy in a tertiary care setting.

Methods

A retrospective observational study was conducted at Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan, including 374 patients who underwent upper gastrointestinal endoscopy between January 2021 and April 2024. Patients were recruited from both inpatient and outpatient departments.

All adult patients (≥18 years) presenting with upper gastrointestinal symptoms, anemia, or chronic liver disease (CLD) were considered eligible for endoscopic evaluation, irrespective of gender. Patients with severe uncontrolled asthma, recent myocardial infarction, impaired level of consciousness, or those unwilling to undergo the procedure were excluded from the study.

All endoscopic procedures were performed under topical pharyngeal anesthesia using lidocaine spray, with patients positioned in the left lateral decubitus position. A standard forward-viewing video gastroscope was introduced under direct visualization to systematically examine the esophagus, stomach, and proximal duodenum. Targeted mucosal biopsies were obtained where clinically indicated, and therapeutic interventions, including variceal band ligation and endoscopic dilatation, were performed as required, in accordance with established guidelines.[3]

For patients presenting with dyspepsia, results of *Helicobacter pylori* stool antigen testing were retrieved from laboratory records, and positivity rates were documented. In patients with CLD, etiological classification was based on clinical records and laboratory investigations. Cases with positive hepatitis B surface antigen or hepatitis C virus antibody/RNA were categorized as chronic viral hepatitis, while those with biochemical and imaging findings consistent with nonalcoholic fatty liver disease were classified accordingly.

Statistical analysis

Data were entered and analyzed using the Statistical Package for Social Sciences, version 26. Descriptive statistics were computed to summarize study variables, with continuous variables expressed as mean ± standard deviation and categorical variables presented as frequencies and percentages. The chi-square test was applied to evaluate associations between categorical variables, including gender, clinical indications, and endoscopic findings. A p-value < 0.05 was considered statistically significant. The results were presented in tables and figures to facilitate clear and systematic interpretation.

Results

A total of 374 patients who underwent upper gastrointestinal endoscopy between January 2021 and April 2024 were included in this retrospective analysis. There was a male predominance (n = 234; 62%), while females accounted for 38% (n = 140) of the study population. The majority of patients (61%) were aged between 31 and 59 years (Table 1).

Table 1. *Age distribution of study participants (n = 374).*

Age Group (years)	Frequency (*n*)	Percentage (%)
≤30	60	16.0
31-44	104	27.8
45-59	130	34.8
≥60	80	21.4
Total	**374**	**100**

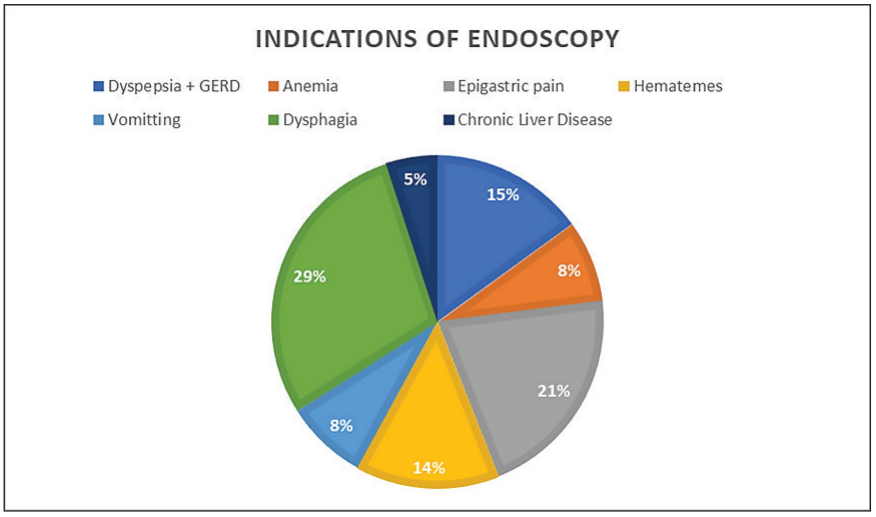

Figure 1. *Indications of endoscopy as reported by patients.*

Table 2. *Endoscopic findings according to gender (n = 374).*

Endoscopic finding	Male (*n*)	Female (*n*)	Total (*n*)	Percentage (%)
Gastritis	90	68	158	42.2
Esophageal/gastric growth	26	8	34	9.1
Hemorrhagic gastritis	2	4	6	1.6
Polyp	3	1	4	1.1
Candidiasis	2	3	5	1.3
Peptic ulcer	8	5	13	3.5
Esophageal varices	34	19	53	14.2
Portal hypertensive gastropathy	30	16	46	12.3
Normal study	30	21	51	13.6
Esophageal stricture	2	2	4	1.1
Total	**227**	**147**	**374**	**100**

The most common indications for endoscopy were dysphagia (*n* = 110; 29.4%), followed by epigastric pain (*n* = 80; 21.4%) and dyspepsia with gastroesophageal reflux disease (GERD) (*n* = 59; 15.8%). Other indications included hematemesis (*n* = 49; 13.1%), anemia (*n* = 28; 7.5%), vomiting (*n* = 27; 7.2%), and CLD (*n* = 21; 5.6%) (Figure 1).

Overall, normal endoscopic findings were observed in 14% of cases. Among abnormal findings, gastritis (*n* = 158; 42.2%) was the most frequent diagnosis, followed by esophageal varices (*n* = 53; 14.2%) and portal hypertensive gastropathy (*n* = 46; 12.3%). Other findings included gastrointestinal growths (*n* = 34; 9.1%), peptic ulcers (*n* = 10; 2.7%), candidiasis (*n* = 5; 1.3%), and esophageal strictures (*n* = 4; 1.1%) (Table 2).

In patients presenting with dysphagia, a substantial proportion demonstrated abnormal findings, with gastritis being the most frequent. Among patients with dyspepsia (*n* = 59), the majority had normal endoscopic findings, followed by gastritis and esophagitis. In cases of hematemesis, esophageal varices (*n* = 22) and gastritis (*n* = 18) were the predominant findings. Patients with chronic most commonly exhibited esophageal varices (*n* = 53) and portal hypertensive gastropathy (*n* = 46).

Among patients with vomiting, approximately 30% showed abnormal findings, whereas 70% had normal endoscopic examinations. Most patients presenting with anemia demonstrated normal endoscopic findings, with only a minority showing pathological abnormalities.

Among dyspeptic patients, retrospective laboratory review revealed that 54% were positive for *Helicobacter pylori* stool antigen. In patients with CLD, chronic viral hepatitis was the most common etiology (68%), followed by nonalcoholic fatty liver disease (16%).

Discussion

Dyspepsia remains one of the most common indications for upper gastrointestinal endoscopy in our study population. In our clinical setting, *H. pylori* infection is routinely screened using stool antigen testing in patients presenting with dyspeptic symptoms, and eradication therapy with standard quadruple regimens is initiated in positive cases.[6] This approach aligns with established clinical practice guidelines and reflects the high burden of *H. pylori*-associated gastritis in our region.

Upper gastrointestinal bleeding, particularly variceal hemorrhage, was a major indication for endoscopy among patients presenting with hematemesis. In our study, most of these cases were effectively managed with endoscopic variceal band ligation, demonstrating a high therapeutic success rate. Furthermore, chronic viral hepatitis emerged as the leading cause of CLD, followed by nonalcoholic fatty liver disease, which is consistent with regional epidemiological trends reported in previous studies.[7,8]

A recent RAND analysis has highlighted that approximately one-sixth of esophagogastroduodenoscopy procedures may be inappropriate, raising concerns regarding the potential overutilization of endoscopy.[9] In contrast, the indications observed in our cohort - primarily dysphagia and epigastric discomfort associated with GERD - were largely appropriate and clinically justified. These findings are comparable to those reported by Ismaila and Misauno [6] where similar symptom profiles constituted the majority of referrals for endoscopy. However, unlike the Nigerian study, which reported a higher prevalence of gastrointestinal malignancies, our study demonstrated a comparatively lower frequency of neoplastic lesions, suggesting possible geographical variation in disease patterns and referral practices.

Interestingly, a considerable proportion of patients presented with epigastric pain and dyspepsia, which may overlap with functional gastrointestinal disorders such as irritable bowel syndrome (IBS). It is plausible that some of these cases represent *H. pylori*-associated gastritis with an exaggerated gastrocolic reflex, although this hypothesis warrants further investigation through prospective studies.

In contrast to findings reported by Kumar et al. [10] where gastritis and duodenitis predominated, our study identified esophageal varices and portal hypertensive gastropathy as the most frequent pathological findings. This difference may reflect the higher prevalence of CLD in our patient population. Similarly, another audit conducted in Pakistan reported epigastric pain as the leading indication for endoscopy, accounting for more than 60% of referrals, which differs from our findings, where dysphagia was the most common indication.[11] These variations highlight the influence

of regional disease burden, referral trends, and healthcare access on endoscopic practice patterns.

Limitations of the study

This study has several limitations. Its retrospective design limited the availability of complete clinical, laboratory, and follow-up data. Being a single-center study, the findings may not be fully generalizable to other populations or healthcare settings. The study also lacked uniform application of diagnostic tests, particularly for *H. pylori*, which may have influenced the interpretation of dyspeptic symptoms. Additionally, selection bias may be present, as only patients who underwent endoscopy were included. Finally, the study did not assess treatment outcomes or long-term follow-up, limiting the evaluation of the clinical impact of endoscopic findings.

Conclusion

Dysphagia and epigastric pain were the predominant indications for upper gastrointestinal endoscopy, while gastritis, esophageal varices, and portal hypertensive gastropathy constituted the most frequent pathological findings. These observations reflect the underlying disease burden in our setting and underscore the continued diagnostic and therapeutic importance of endoscopy.

Acknowledgement

The authors would like to acknowledge the staff and administration of Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan, for their support during the execution of this study.

List of Abbreviations

GI	Gastrointestinal tract
IBS-D	Irritable bowel syndrome

Conflict of interest

None to declare.

Grant support and financial disclosure

None to disclose.

Ethical approval

The ethical approval of the study was granted by the Institutional Ethics Committee of Islamabad Medical and Dental College and Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan vide Letter No: 78/IMDC/ IRB-2021 dated 4th January, 2021.

Authors' contributions

AH: Concept and design of the study, critical intellectual input, acquisition and analysis of data, drafted the manuscript.

MA, ZI: Acquisition of the data, critical revision of the manuscript, drafting of the manuscript.

ALL AUTHORS: Approval and responsibility of the final version of the manuscript to be published.

Authors ' Details

Asim Hassan[1], Mohammad Ali[2], Zahra Iqbal[3]

1. Consultant Gastroenterologist and Hepatologist, Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan
2. House officer at Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan
3. Lecturer, Department of Pharmacology, Islamabad Medical and Dental College, Islamabad, Pakistan

References

1. Long MD, Bajaj JS. Endoscopy: scoping the way forward. Am J Gastroenterol. 2023;118(10):1709–10. https://doi.org/10.14309/ajg.0000000000002493
2. Khalid A, John A, Ali A, Batool N, Zamir A. Frequency of gastrointestinal diseases diagnosed on barium contrast studies. Pak BioMed J. 2022;5(5):325–9. https://doi.org/10.54393/pbmj.v5i5.511
3. Sidhu R, Zammit SC, Baltes P, Carretero C, Despott EJ, Murino A, et al. Curriculum for small-bowel capsule endoscopy and device-assisted enteroscopy training in Europe: eSGE position statement. Endoscopy. 2020;52(8):669–86.
4. Glisic T, Stojkovic Lalosevic M, Milovanovic T, Rankovic I, Stojanovic M, Toplicanin A, et al. Diagnostic value of non-invasive scoring systems in the prediction of esophageal varices in patients with liver cirrhosis: single-center experience. Medicina (Kaunas). 2022;58(2):158.
5. Akpunonu B, Hummell J, Akpunonu JD, Ud Din S. Capsule endoscopy in gastrointestinal disease: evaluation, diagnosis, and treatment. Cleve Clin J Med. 2022;89(4):200–11.
6. Ismaila BO, Misauno MA. Gastrointestinal endoscopy in Nigeria: a prospective two-year audit. Pan Afr Med J. 2013;14(22):1–6.
7. Yahya M, Faruqi SJ, Memon AR. Endoscopic findings in patients presenting with dysphagia: an observational study. Int J Surg Med. 2020;6(3):6–9. https://doi.org/10.5455/ijsm.Endoscopic-findings-patients-presenting-dysphagia
8. Harada T, Watari T, Watanuki S, Hiroshige J, Kushiro S, Miyagami T, et al. Diagnostic error rates and associated factors for lower gastrointestinal perforation. Sci Rep. 2022;12(1):1028. https://doi.org/10.1038/s41598-021-04762-y
9. Pouw RE, Barret M, Biermann K, Bisschops R, Czakó L, Gecse KB, et al. Endoscopic tissue sampling—Part 1: upper gastrointestinal and hepatopancreatobiliary tracts. Endoscopy. 2021;53(11):1174–88. https://doi.org/10.1055/a-1611-5091
10. Kumar DS, Ignatius Pandey DH, Verma DA, Pratim Deb DP. Prospective analysis of 500 cases of upper GI endoscopy at Tata Main Hospital. IOSR J Dent Med Sci. 2014;13(1):21–5.
11. Kamran M, Fawwad A, Haider SI, Hussain T, Ahmed J. Upper gastrointestinal endoscopy: a study from a rural population of Sindh, Pakistan. Pak J Med Sci. 2021;37(1):9–14.