Section: Gastroenterology

Original Research Article

A RETROSPECTIVE AUDIT OF UPPER GASTROINTESTINAL ENDOSCOPIES AT A TERTIARY CARE CENTRE IN KOLHAPUR

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ABSTRACT

Background: Upper gastrointestinal (GI) endoscopy is a critical diagnostic and therapeutic tool in gastroenterology. Regular audits help assess its utilization, diagnostic yield, and therapeutic impact, especially in resource-limited settings. The aim is to audit the indications, findings, and therapeutic outcomes of upper GI endoscopies performed at a tertiary care centre in Kolhapur, Maharashtra.

Materials and Methods: This retrospective study analyzed data from 634 patients who underwent upper GI endoscopy between August 2022 and October 2024. Patient demographics, indications, endoscopic findings, and therapeutic procedures were recorded. Statistical analysis included frequency distributions and association testing, with significance set at $p<0.01$.

Results: The study cohort included 437 males (68.9%) and 197 females (31.1%), with a mean age of 48.94±15.8 years. Dyspepsia (41.8%) was the most common indication, followed by screening for esophageal varices (29.5%). Normal mucosa was observed in 49.7% of cases. Among abnormal findings, gastric and duodenal ulcers (5.0%), esophageal varices (4.3%), and upper GI malignancies (2.8%) were notable. Therapeutic interventions were performed in 16.9% of cases, with endoscopic variceal ligation being the most frequent (6.1%). Significant gender-based differences were found in both endoscopic findings ($p=0.001$) and therapeutic procedures ($p=0.017$).

Conclusion: This audit highlights the high diagnostic value of upper GI endoscopy in evaluating common gastrointestinal complaints and chronic liver disease. The predominance of normal findings and the low rate of malignancy detection underscore the need for judicious patient selection. Regular audits and adherence to clinical guidelines can enhance diagnostic efficiency, optimize resource use, and improve patient outcomes in tertiary healthcare settings.

Keywords: Upper GI endoscopy, Audit, Dyspepsia, Esophageal varices, Therapeutic interventions, Gastroenterology.

INTRODUCTION

Upper gastrointestinal (GI) endoscopy has revolutionized gastroenterological practice by providing an indispensable tool for the accurate diagnosis and effective management of a wide range of gastrointestinal disorders. Its significance lies in its minimally invasive nature, direct visualization capabilities, and the ability to perform therapeutic interventions concurrently during diagnostic evaluation. This method has substantially enhanced patient care by enabling the early detection and management of potentially life-threatening conditions such as gastrointestinal bleeding, esophageal varices, peptic ulcer disease, and malignancies.[1]

The rising prevalence of gastrointestinal disorders, particularly those linked to lifestyle factors such as alcohol and tobacco use, underscores the critical need for periodic audits of endoscopic procedures. Auditing ensures that clinical practices align with established guidelines, optimizing resource utilization and safeguarding patient outcomes. Research has consistently demonstrated that regular audit interventions significantly improve the quality

of reporting and clinical outcomes associated with upper GI endoscopies.[2]

With continuous advancements in endoscopic technology, there is an increasing expectation for enhanced diagnostic accuracy and therapeutic effectiveness. However, disparities in practice standards across healthcare facilities highlight the necessity for ongoing quality assurance, particularly in resource-limited or developing healthcare settings.[3]

In light of these considerations, the present study was undertaken to audit upper gastrointestinal endoscopy practices at a tertiary care center in Kolhapur. This audit aims to evaluate the indications, diagnostic findings, and therapeutic outcomes of upper GI endoscopies performed at the center, identifying potential gaps in current practices and recommending areas for clinical improvement.

MATERIALS AND METHODS

Study Design and Setting: This was a retrospective observational study conducted at the Department of Gastroenterology, D.Y. Patil Medical College, Kolhapur. The study analyzed data from all upper gastrointestinal (GI) endoscopies performed between August 2022 and October 2024.

Data Collection: Patient records were reviewed, and relevant clinical data were extracted from endoscopy reports and medical records. The collected data included:

- Patient demographics: Age, gender, and comorbidities.
- Indications for endoscopy: Reasons for referral, including dyspepsia, screening for esophageal varices, dysphagia, and other conditions.
- Endoscopic findings: Normal versus abnormal findings, including ulcers, varices, strictures, erosions, malignancies, and other lesions.
- Therapeutic interventions: Procedures such as endoscopic variceal ligation, dilation, biopsy collection, stent placement, or foreign body removal.

Outcomes Assessed: The study aimed to evaluate the distribution of indications, the prevalence of different endoscopic findings, and the frequency of therapeutic interventions.

Statistical Analysis: Descriptive statistics were used to summarize the data. Continuous variables were presented as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. Associations between variables were assessed using appropriate statistical tests, with a p-value <0.01 considered statistically significant.

RESULTS

Patient Demographics and Clinical Characteristics

This study included a total of 634 patients who underwent upper gastrointestinal (GI) endoscopy at a tertiary care center. The mean age of the participants was 48.94 years (range: 9–96 years, SD: 15.80), reflecting a wide age distribution. A significant male predominance was observed, with 437 (68.9%) males and 197 (31.1%) females undergoing endoscopy. The male-to-female ratio of approximately 2:1 is in line with previously reported demographic patterns in upper GI endoscopy studies. [Table 1]

Referral Patterns and Clinical History

The vast majority of endoscopies (92.7%, n=588) were performed for patients referred from the Medicine department, whereas only 7.3% (n=46) were from the Surgery department. A considerable proportion of the study population exhibited risk factors associated with upper GI diseases. Tobacco consumption was reported in 33.1% (n=210) of cases, and 38.5% (n=244) of the patients had a history of alcohol consumption. The frequency of proton pump inhibitor (PPI) use was 41.5% (n=263), indicating that a significant proportion of patients were on acid suppression therapy prior to endoscopy. NSAID usage was comparatively lower, with 6.8% (n=43) reporting regular use. Viral markers, including HIV (0.2%, n=1), HBsAg (0.5%, n=3), and HCV (0.2%, n=1), were rarely positive, suggesting a low prevalence of chronic viral infections in this cohort. [Table 1]

Table 1: Patient Demographics

Variable	Category/Measure	Frequency / Value	Percent / SD
Age	Minimum	9	
	Maximum	96	
	Mean	48.94	
	Standard Deviation		15.80
Sex	Female	197	31.1%
	Male	437	68.9%
Referring Department	Medicine	588	92.7%
	Surgery	46	7.3%
Tobacco Use	Yes	210	33.1%
	No	424	66.9%
Alcohol Use	Yes	244	38.5%
	No	390	61.5%
PPI Use	Yes	263	41.5%
	No	371	58.5%
NSAID Use	Yes	43	6.8%
	No	591	93.2%
HIV Status	Positive	1	0.2%

	Negative	633	99.8%
HBsAg Status	Positive	3	0.5%
	Negative	631	99.5%
HCV Status	Positive	1	0.2%
	Negative	633	99.8%

This table presents the demographic characteristics of the study population, including age, sex, referring department, and relevant lifestyle factors.

Indications for Endoscopy: The most common indication for performing upper GI endoscopy was dyspepsia, which accounted for 41.8% (n=265) of cases. The second most frequent indication was screening for esophageal varices (29.5%, n=187), reflecting a high burden of chronic liver disease in the study population. Other indications included dysphagia (5.8%, n=37), malena (2.2%, n=14), and cases involving foreign body ingestion (n=4) and corrosive ingestion (n=5). A statistically significant difference (p=0.001) was observed between male and female patients in terms of indications for endoscopy. [Table 2]

Table 2: Indications for Endoscopy by Gender

Indications		**Gender**			
		Female	**Male**	**Total**	**P value**
Dyspepsia	N	108	157	265	
	%	40.8%	59.2%	100.0%	
Stent removal	N	6	14	20	
	%	30.0%	70.0%	100.0%	
To rule out Varices	N	26	161	187	
	%	13.9%	86.1%	100.0%	
Consumption of corrosive substances	N	1	4	5	
	%	20.0%	80.0%	100.0%	
Dysphagia	N	19	18	37	0.001**
	%	51.4%	48.6%	100.0%	
Foreign body ingestion	N	1	3	4	
	%	25.0%	75.0%	100.0%	
Malena	N	5	9	14	
	%	35.7%	64.3%	100.0%	
Dyspepsia and Malena	N	9	10	19	
	%	47.4	52.6%	100.0	
Periampullary tumor	N	0	1	1	
	%	0.0	100.0	100.0	
Others	N	22	60	82	
	%	26.9	73.1	100.0	
Total		197	437	634	

**- Highly significant

This table categorizes the indications for endoscopy among male and female patients, along with statistical significance values.

Endoscopic Findings

Among the study participants, nearly 49.7% (n=315) of cases showed normal mucosa, indicating a substantial number of negative diagnostic outcomes. Among abnormal findings, the most prevalent were gastric and duodenal ulcers (5.0%, n=32), esophageal varices (4.3%, n=27), and gastric erosions (n=4). Other notable findings included erythematous gastritis (n=5) and upper GI malignancies (n=18, 2.8%). A highly significant association (p=0.001) was found between gender and endoscopic findings, with males having a higher prevalence of esophageal varices and gastric ulcers. [Table 3 & Figure 1]

Table 3: Endoscopic Findings by Gender

Findings		**Gender**			**P value**
		Female	**Male**	**Total**	
Normal mucosal study	N	134	181	315	
	%	42.5	57.5	100.0	
Oesophageal stricture	N	5	14	19	
	%	26.3	73.7	100.0	
Plummer-Vinson Syndrome	N	6	1	7	
	%	85.7	14.3	100.0	
Fundal Varices	N	2	9	11	
	%	18.2	81.8	100.0	
Other findings	N	23	79	102	
	%	22.5	77.5	100.0	
Oesophageal varices	N	4	23	27	0.001**
	%	14.8	85.2	100.0	

Gastric erosions	N	0	4	4	
	%	0.0	100.0	100.0	
Tumours	N	8	10	18	
	%	44.4	55.6	100.0	
Duodenal ulcers	N	1	14	15	
	%	6.7	93.3	100.0	
Gastric ulcers	N	0	17	17	
	%	0.0	100.0	100.0	
Oesophageal ulcers	N	2	4	6	
	%	33.3	66.7	100.0	
Erythematous gastritis	N	0	5	5	
	%	0.0	100.0	100.0	
Oesophagitis	N	2	9	11	
	%	18.2	81.8	100.0	
Hiatus hernia	N	1	1	2	
	%	50.0	50.0	100.0	
Oesophageal and gastric ulcers	N	0	1	1	
	%	0.0	100.0	100.0	
Duodenal stricture	N	0	1	1	
	%	0.0	100.0	100.0	
GAVE	N	0	2	2	
	%	0.0	100.0	100.0	
Obliterated varices	N	0	2	2	
	%	0.0	100.0	100.0	
Oesophageal stricture with PHG	N	1	0	1	
	%	100.0	0.0	100.0	
Fundal varices with PHG	N	0	2	2	
	%	0.0	100.0	100.0	
Oesophageal varices with PHG	N	6	40	46	
	%	13.0	87.0	100.0	
Duodenal stricture with PHG	N	0	1	1	
	%	0.0	100.0	100.0	
PHG alone	N	2	17	19	
	%	10.5	89.5	100.0	
Total	N	197	437	634	

GAVE – Gastric Antral Vascular ectasia, PHG - Portal hypertensive Gastropathy, **- Highly significant

This table summarizes the key findings observed during endoscopy, highlighting significant differences between genders.

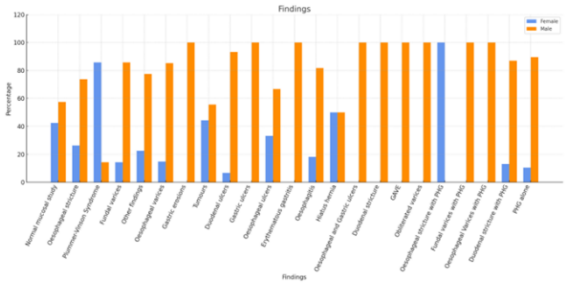

Figure 1: Distribution of Endoscopic Findings

(This figure visually represents the frequency of different endoscopic findings in the study population.)

This figure shows the different findings among both the genders in the study population. The study revealed notable endoscopic findings such as normal mucosal studies (315 cases) and various ulcers. Portal hypertensive gastropathy with oesophageal stricture (females) and duodenal stricture(males) accounted for only 1 case each ,oesophageal varices with Portal hypertensive gastropathy accounted for 46 cases with male predominance(40 cases). The gender distribution showed highly statistically significant differences (P=0.001) across many findings.

Therapeutic Interventions

While 83.1% (n=527) of patients did not require any therapeutic intervention, 6.1% (n=39) underwent endoscopic variceal ligation, making it the most frequently performed therapeutic procedure. Biopsies were obtained in 29 cases (4.6%). Additional interventions included stent removal (n=15), CRE dilatation (n=11), PEG tube insertion (n=1), and foreign body removal (n=1). Gender-based differences in therapeutic procedures were statistically significant (p=0.017), with males undergoing more endoscopic variceal ligation and stent removals. [Table 4 & Figure 2]

Table 4: Therapeutic Procedures Performed by Gender

Therapeutic Procedure		**Gender**			**P value**
		Female	**Male**	**Total**	
Stent removal	N	4	11	15	
	%	26.7	73.3	100.0	
No procedure	N	167	360	527	
	%	31.7	68.3	100.0	
Endoscopic variceal ligation	N	5	34	39	

	%	12.8	87.2	100.0	
Endoscopic CRE Dilatation	N	5	6	11	
	%	45.5	54.5	100.0	
Biopsy	N	8	21	29	
	%	27.6	72.4	100.0	
PEG Tube insertion	N	0	1	1	
	%	0.0	100.0	100.0	
Endo-therapy glue injection	N	1	3	4	0.017*
	%	25.0	75.0	100.0	
Savary-Gilliard dilation	N	5	1	6	
	%	83.3	16.7	100.0	
Unsuccessful banding	N	1	0	1	
	%	100.0	0.0	100.0	
Foreign body(coin) removal	N	1	0	1	
	%	100.0	0.0	100.0	
Total	N	197	437	634	

PEG-Percutaneous Endoscopic Gastronomy * Statistically significant (P < 0.05)

This table lists the different therapeutic interventions performed in the study population, comparing gender distribution.

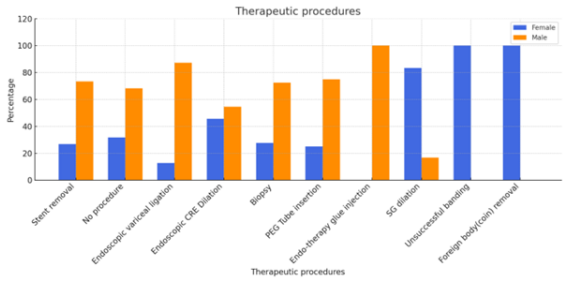

Figure 2: Distribution of Therapeutic Procedures Performed

(This figure illustrates the various therapeutic interventions performed in the study population, comparing gender distribution.)

This figure shows different therapeutic procedure among both the genders in the study population. A high number of participants (527) underwent no procedures, Endoscopic variceal ligation (39 cases) were the second most therapeutic procedures followed by biopsy (29 cases) while stent removals were performed in 15 cases. Endo-therapy glue injection and SG ligation accounted for 4 and 6 cases respectively. Only 1case each of therapeutic procedure were performed for PEG tube insertion, unsuccessful banding and foreign body(coin) removal. Statistically significant differences in therapeutic approaches were noted based on gender (P=0.017).

DISCUSSION

This prospective audit of upper gastrointestinal (GI) endoscopies at a tertiary care center in Kolhapur provides valuable insights into the indications, findings, and therapeutic interventions associated with the procedure. The demographic profile of the study population, with a male predominance (68.9%) and a mean age of 48.94 years, is consistent with previous audits of endoscopic procedures, where male gender and middle-aged individuals have been reported as the most common recipients of upper GI endoscopy.[1] The predominance of referrals from the Medicine department (92.7%) emphasizes the crucial role of internal medicine in managing upper GI disorders, a pattern similarly noted in tertiary care settings.

Dyspepsia (41.8%) emerged as the most common indication for endoscopy, aligning with earlier findings that suggest functional dyspepsia as a leading reason for endoscopic evaluation.7 Screening for esophageal varices (29.5%) was another major indication, underscoring the significant burden of chronic liver disease, particularly in males, where alcohol-related liver disease plays a contributing role. The statistical significance of gender differences in endoscopy indications highlights the impact of lifestyle factors such as alcohol consumption and smoking, which were prevalent among the study population. Previous studies have shown that alcohol use significantly increases the risk of developing esophageal varices, necessitating frequent endoscopic surveillance.[4]

The high rate of normal mucosal findings (49.7%) indicates that nearly half of the procedures did not reveal significant pathology, a trend frequently reported in audits evaluating upper GI endoscopy utilization. While this may highlight the need for stricter patient selection criteria, it also reinforces the role of endoscopy in ruling out serious conditions. Among abnormal findings, peptic ulcer disease (5.0%) and esophageal varices (4.3%) were predominant, consistent with previous reports in similar patient cohorts. The prevalence of upper GI malignancies (2.8%) in this study is comparable to international and national data, reinforcing the need for timely diagnostic evaluations in high-risk populations.[1,2]

Therapeutic interventions were required in 16.9% of cases, with endoscopic variceal ligation (6.1%) being the most frequently performed procedure. This is in line with prior studies emphasizing the role of endoscopy in the prophylactic and emergent management of esophageal varices.[5] The statistical significance (p=0.017) observed in gender-based differences in therapeutic procedures further highlights the increased burden of esophageal varices and related interventions among males. Furthermore,

the relatively low rate of biopsies (4.6%) suggests that most endoscopic findings were either benign or not clinically suspicious for malignancy, a pattern observed in previous endoscopic audits.[6,7]

The strengths of this study include its prospective design and comprehensive data collection, which allowed for an accurate assessment of endoscopic practices in a tertiary care setting. However, several limitations should be acknowledged. The exclusion of critically ill patients, those with advanced malignancies, and ICU readmissions may have introduced selection bias, potentially underestimating the burden of severe GI pathology. Additionally, this was a single-center study, which limits the generalizability of findings to broader populations. Another limitation was the absence of histopathological correlation for biopsied lesions, which could have provided deeper insights into the diagnostic yield of endoscopy. Furthermore, long-term patient outcomes following therapeutic interventions, such as variceal ligation or ulcer management, were not analyzed, leaving a gap in understanding the sustained impact of endoscopic procedures on clinical prognosis. Future studies should focus on multi-center collaborations with larger sample sizes to enhance the validity of findings, incorporate histopathological data for a more precise diagnostic approach, and include follow-up assessments to evaluate long-term patient outcomes after endoscopic interventions.

Clinical Implications and Recommendations: Our study highlights key areas for improvement in endoscopic practice and patient management. The high burden of dyspepsia as the primary indication suggests a need for stricter triaging criteria to ensure appropriate use of endoscopy and reduce unnecessary procedures. The low malignancy detection rate further underscores the importance of adhering to guideline-based indications, optimizing resource utilization while maintaining diagnostic accuracy. The significant prevalence of tobacco and alcohol use among patients calls for early lifestyle interventions to mitigate GI morbidity and reduce the incidence of serious conditions such as esophageal varices and peptic ulcer disease. Additionally, the findings reinforce the essential role of routine variceal screening in cirrhotic patients to prevent life-threatening hemorrhagic complications. Implementing these recommendations in clinical practice may improve patient outcomes, optimize endoscopy utilization, and enhance the overall quality of GI care in tertiary healthcare settings.

CONCLUSION

This audit highlights the predominant indications, diagnostic yield, and therapeutic interventions associated with upper GI endoscopy in a tertiary care setting. The findings reinforce the importance of stringent patient selection criteria to optimize resource utilization and patient outcomes. Enhanced adherence to clinical guidelines and expanded screening for high-risk populations, particularly those with chronic liver disease, may further improve the efficacy of endoscopic practices. Future research should focus on long-term patient outcomes and the cost-effectiveness of endoscopic screening programs in similar healthcare settings.

REFERENCES

1. Waheed, A., Sial, T.G., Farooq, M., & Zafar, S. (2024). Upper Gastrointestinal Endoscopy: A Clinical Audit of Indications and Diagnosis. A 5-Year Data Analysis of Tertiary Care Centre. Journal of Pakistan Society of Internal Medicine, 5(3), 587-590.
2. Lisboa-Gonçalves, P., Libânio, D., Marques-Antunes, J., Dinis-Ribeiro, M., & Pimentel-Nunes, P. (2018). Quality of Reporting in Upper Gastrointestinal Endoscopy: Effect of a Simple Audit Intervention. GE Portuguese Journal of Gastroenterology, 26(1), 24-32.
3. Ismaila BO, Misauno MA. Gastrointestinal endoscopy in Nigeria--a prospective two year audit. Pan Afr Med J. 2013;14:22. doi: 10.11604/pamj.2013.14.22.1865. Epub 2013 Jan 15. PMID: 23503686; PMCID: PMC3597902.
4. Sutton R, Shields R. Alcohol and oesophageal varices. Alcohol Alcohol. 1995 Sep;30(5):581-9. doi: 10.1093/oxfordjournals.alcalc.a045767.
5. Goenka AS, Dasilva MS, Cleghorn GJ, Patrick MK, Shepherd RW. Therapeutic upper gastrointestinal endoscopy in children: an audit of 443 procedures and literature review. J Gastroenterol Hepatol. 1993;8(1):44-51. doi: 10.1111/j.1440-1746.1993.tb01174.x. PMID: 8439662.
6. Naqvi I, Talib A, Tabraze M, et al. Upper Gastrointestinal Endoscopic Outcomes in Patients with Gastrointestinal Symptoms: Retrospective Analysis at a Tertiary Care Hospital. Open J Gastroenterol. 2019;9(8):141-157. doi: 10.4236/ojgas.2019.98017.
7. Kamboj AK, Hoversten P, Leggett CL. Upper gastrointestinal bleeding: etiologies and management. Mayo Clin Proc. 2019;94(4):697-703.