



ORIGINAL RESEARCH PAPER

UPPER GASTROINTESTINAL ENDOSCOPY IN SYMPTOMATIC CHOLELITHIASIS: PREVALENCE OF SIGNIFICANT FINDINGS AND CLINICAL IMPLICATIONS IN A SOUTH INDIAN TERTIARY CENTRE

General Surgery

KEY WORDS: cholelithiasis; dyspepsia; upper gastrointestinal endoscopy; gastritis; cholecystectomy

Dr Fazil Navabjan*

Department of General Surgery, Government Sivaganga Medical College and Hospital, Sivaganga, Tamil Nadu, India*Corresponding Author

Dr K. Jeyaramprasath

Department of General Surgery, Government Sivaganga Medical College and Hospital, Sivaganga, Tamil Nadu, India

Dr B Jeyalakshmi

Department of General Surgery, Government Sivaganga Medical College and Hospital, Sivaganga, Tamil Nadu, India

ABSTRACT

Background and Aims: Gallstone disease is increasingly prevalent in India and frequently presents with dyspeptic symptoms that may overlap with upper gastrointestinal (GI) pathology. This study aimed to determine the frequency of significant upper GI endoscopic findings in patients with ultrasound-proven symptomatic cholelithiasis presenting with chronic dyspepsia. **Methods:** A retrospective study was conducted at the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai, from June 2015 to May 2016. One hundred and twelve patients (age > 16 years) with ultrasound-proven gallbladder stones and chronic dyspeptic complaints underwent upper GI endoscopy using a flexible OGD scope. Findings were tabulated and analyzed by age and sex. **Results:** Significant endoscopic lesions were identified in 82 of 112 patients (73.2%). Females comprised 73.2% of the cohort. The most common finding was gastritis (48.2%), followed by duodenitis (25.9%), reflux esophagitis (11.6%), hiatus hernia (9.8%), and gastric and duodenal ulcer (1.8% each). Significant lesions were more prevalent in females across all age groups and increased in frequency with advancing age, reaching 100% in the >60 years group. **Conclusions:** A high proportion of patients with symptomatic cholelithiasis harbour concurrent upper GI pathology detectable by endoscopy. Routine preoperative upper GI endoscopy before elective cholecystectomy may help identify co-existing treatable conditions, reduce unnecessary surgery, and decrease postoperative symptom persistence.

INTRODUCTION

Gallstone disease (cholelithiasis) has become increasingly common in India over recent decades, a trend attributed to advances in abdominal imaging and significant lifestyle modification.[1] The majority of gallstones discovered incidentally on routine ultrasonography are asymptomatic, and prospective studies suggest that asymptomatic stones rarely cause serious complications during the patient's lifetime.[2,3]

Symptomatic cholelithiasis, however, presents a clinically challenging picture. Symptoms may be acute or chronic, and the chronic dyspeptic presentation, classically termed flatulent dyspepsia and encompasses epigastric pain, postprandial bloating, belching, nausea, and vomiting.[4] The fundamental diagnostic difficulty is that these symptoms are non-specific and may originate from concurrent upper gastrointestinal pathology rather than, or in addition to, the gallbladder itself. However, the radiological demonstration of gallstones does not exclude other disorders responsible for a patient's symptoms.[5]

Several published research have documented persistent abdominal symptoms in a significant proportion of patients following cholecystectomy, suggesting that pre-existing upper GI pathology was responsible for some or all of the presenting complaints.[6,7,8] This observation underscores the clinical importance of evaluating the upper GI tract before surgery, since failure to identify a co-existing treatable condition may result in postoperative symptom persistence and an avoidable operation.[9]

Upper GI endoscopy (esophagogastroduodenoscopy, EGD) is a highly sensitive tool for diagnosing mucosal pathology. However, its routine application in the preoperative workup of patients with symptomatic cholelithiasis remains debated. Studies from Western countries have generally reported that fewer than 30% of such patients have significant upper GI findings at endoscopy. [10,11] Data from the Indian subcontinent, where dietary habits, *Helicobacter pylori* prevalence, and referral patterns differ markedly, remain limited.

The present study was conducted to study the prevalence of symptomatic dyspepsia and determine the co-incidence of significant upper GI endoscopic findings in a South Indian population with ultrasound-proven symptomatic gallstone disease presenting with chronic dyspepsia.

METHODS

Study Design and Setting

This was a retrospective study conducted in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai, India—a tertiary referral centre. The study period spanned June 2015 to May 2016. Ethical committee approval was obtained from the Dean's office at Government Stanley Medical College Hospital prior to commencement. All authors had access to the study data and reviewed and approved the final manuscript.

Participants

Patients presenting to the general surgery outpatient department, or referred from other departments, with symptomatic cholelithiasis fulfilling the inclusion criteria were enrolled. The final sample comprised 112 patients.

Inclusion criteria were: (1) age greater than 16 years; (2) ultrasonogram-proven single or multiple gallbladder stones; (3) presence of one or more of the following chronic dyspeptic complaints—pain in the epigastrium or right upper quadrant, postprandial pain, constant pain accompanied by nausea and vomiting, or belching/bloating/indigestion; and (4) written informed consent to participate.

Exclusion criteria were: (1) age less than 16 years; (2) acute abdomen or colicky pain; (3) haemodynamic instability; and (4) refusal to provide consent.

Endoscopic Technique

All patients were kept nil per oral for at least six hours prior to the procedure. Intravenous access was established; no prophylactic antibiotics or intravenous sedation were administered. Oral dentures and spectacles were removed. A 1% lignocaine jelly was applied to the endoscope tip to

suppress the gag reflex. Patients were positioned in the left lateral decubitus position with the head slightly elevated.

A standard 120 cm forward-viewing flexible endoscope (OGD scope) was used. The instrument was lubricated, inserted through a mouthpiece, and advanced under direct vision over the tongue, uvula, epiglottis, and cricopharynx into the cervical oesophagus as the patient swallowed. The endoscope was advanced to the proximal duodenum. Systematic inspection and mucosal sampling were performed during withdrawal with the viscerawell -distended by air insufflation. Anatomical landmarks—the cricopharyngeal fold, gastro-oesophageal junction (GEJ), lower oesophageal sphincter, pylorus, and superior duodenal angle were documented. All findings were recorded in a structured proforma.

Outcome Variables

The primary outcome was the prevalence of significant endoscopic lesions, defined as any finding other than a completely normal examination. Secondary outcomes included: the distribution of specific diagnoses (gastritis, gastric ulcer, duodenitis, duodenal ulcer, reflux esophagitis, and hiatus hernia); the prevalence of significant findings stratified by sex; and the relationship between age group and the prevalence of significant lesions.

Statistical Analysis

Data were entered into a structured proforma and tabulated using Excel and SPSS v17. Categorical variables are expressed as frequencies and percentages. Age and sex distribution charts were constructed and prevalence was stratified accordingly. A p-value for the association between gastritis and age above 60 years was calculated and assessed for statistical significance.

RESULTS

Sociodemographic Characteristics

A total of 112 patients with ultrasound-proven symptomatic cholelithiasis and chronic dyspepsia were studied. The age distribution is summarised in Table 1. The largest group (52.7%) was in the 21–40 year age range, and subjects under 40 years of age comprised 54.5% of the total cohort. Only 11.6% were older than 60 years.

Table 1. Age Distribution of Total Subjects (n=112)

Age Group	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Upto 20 years	2	1.8	1.8	1.8
21–40 years	59	52.7	52.7	54.5
41–60 years	38	33.9	33.9	88.4
Above 60 years	13	11.6	11.6	100.0
Total	112	100.0	100.0	

Female patients predominated, comprising 82 of 112 subjects (73.2%), with 30 males (26.8%) as shown in Table 2.

Table 2. Gender Distribution of Total Subjects (n= 112)

Gender	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Female	82	73.2	73.2	73.2
Male	30	26.8	26.8	100.0
Total	112	100.0	100.0	

Overall Endoscopic Findings

Significant endoscopic lesions were identified in 82 of 112 patients (73.2%), while 30 patients (26.8%) had a completely normal examination (Table 3).

Table 3. Distribution of Subjects with Significant Versus Normal Endoscopic Study (n=112)

Endoscopic Finding	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Significant Lesions	82	73.2	73.2	73.2
Normal	30	26.8	26.8	100.0
Total	112	100.0	100.0	

The spectrum of individual findings is presented in Table 4. Gastritis was the most prevalent diagnosis, identified in 48.2% of patients. Duodenitis was the second most common finding (25.9%), followed by reflux esophagitis (11.6%), hiatus hernia (9.8%), and gastric and duodenal ulcer (1.8% each).

Table 4. Distribution of Various Endoscopic Findings (n= 112)

Endoscopic Finding	Present—YES (%)	Absent—NO (%)
Normal Study	26.8	73.2
Gastritis	48.2	51.8
Gastric Ulcer	1.8	98.2
Duodenitis	25.9	74.1
Duodenal Ulcer	1.8	98.2
Reflux Esophagitis	11.6	88.4
Hiatus Hernia	9.8	90.2

Percentages indicate the proportion of the total study cohort (n=112) with each finding present or absent.

Sex-Stratified Analysis

Of the 82 female patients, 58 (70.7%) had significant endoscopic findings. Among the 30 male patients, 24 (80.0%) had significant findings. The prevalence of significant lesions across all individual diagnoses was higher in females than in males across all age groups, consistent with the female predominance of the overall study cohort.

Age-Stratified Analysis

Among the 51 patients aged above 40 years, 43 (84.3%) had significant lesions. The prevalence of significant findings among those aged 41–60 years was 84.3%, and in those above 60 years it was 100%. This increasing gradient with age supports the hypothesis that the burden of co-existing upper GI pathology rises with advancing age. The p-value for the association between gastritis and age above 60 years was statistically significant, a finding consistent with the geographic location of the study centre, local dietary customs including high intake of spices and chillies, and cultural practices of the population served.

DISCUSSION

This retrospective study of 112 patients with ultrasound-proven symptomatic cholelithiasis and chronic dyspepsia demonstrated a high prevalence (73.2%) of significant upper GI endoscopic findings. This figure substantially exceeds the rates of less than 30% reported by Ure et al, Yavorski et al, and Schwenk et al in Western cohorts. [10, 11, 12] However, it aligns closely with findings from comparable institutional studies. Anandaravi et al, in a prospective study of 400 symptomatic cholelithiasis patients conducted at Sri Ramachandra Medical Center, Chennai, reported that pathological findings were present in 75.5% of patients on preoperative UGI endoscopy, with gastritis constituting the most frequent diagnosis. [16] Similarly, Khedkaret al, in a study evaluating the diagnostic value of UGI endoscopy prior to elective laparoscopic cholecystectomy, found significant pathological OGD findings in 72.5% of patients, predominantly gastric pathology. [17] These two Indian institutional series, both reporting positive endoscopic findings in excess of 70%, are in close accord with our own prevalence of 73.2% and collectively underscore the substantially higher burden of concurrent upper GI pathology observed in South Asian tertiary referral populations compared to the Western series of Thybusch et al, Dhaliwal et al, and Rashid et al, who identified significant lesions in more than 50% of symptomatic gallstone patients. [13, 14, 15]

The discrepancy between the present results and those of Western series may be explained by several factors. Firstly, the sample size in this study is relatively small compared to the larger multicenter European datasets. Secondly, Government Stanley Medical College Hospital is a tertiary referral centre specializing in surgical care; patients referred to such institutions tend to have more advanced or refractory disease, having been treated conservatively elsewhere, thus inflating the apparent prevalence of significant lesions. Morrison et al., in a study conducted at a South African public hospital that serves a predominantly referred patient population, similarly observed rates of concurrent upper GI pathology that exceeded 20–46%, validating the practice of routine preoperative UGI endoscopy in their setting. [18] The role of dietary and infective cofactors unique to this region cannot be overlooked; population-level differences in *Helicobacter pylori* endemicity and dietary composition are well-established contributors to the higher background prevalence of gastroduodenal pathology in South Indian cohorts. [16] The female predominance in this cohort (73.2%) is consistent with the well-established epidemiology of gallstone disease, which disproportionately affects women due to hormonal, dietary, and metabolic factors. [1,4] The observation that significant endoscopic findings were more prevalent in females across all age groups is supported by prior literature. Study by Anandaravi et al reported a female-to-male ratio of 2.2:1 in their symptomatic cholelithiasis cohort, strikingly similar to the 2.7:1 ratio observed here, reinforcing the view that female sex confers heightened susceptibility both to cholelithiasis and to the concurrent gastroduodenal pathology that may underlie dyspeptic symptoms. [16]

The finding that the prevalence of significant lesions increased progressively with age. Older patients with symptomatic cholelithiasis were more likely to have concurrent upper GI pathology, and this group arguably stands to benefit most from preoperative endoscopic evaluation. The statistically significant association between gastritis and age over 60 years likely reflects cumulative mucosal injury from decades of dietary, pharmacological, and infective exposures, including *Helicobacter pylori*, which remains highly prevalent in this region of South India.

Gastritis was the single most common endoscopic diagnosis (48.2%), a pattern consistent with the high background prevalence of gastritis in South Indian populations and with the geographic and dietary context of the study institution. This finding is corroborated by the Chennai study of Anandaravi et al, who similarly identified gastritis as the predominant pathology in 22% of patients on UGI endoscopy, with gastric erosions in a further 19%, suggesting that gastric mucosal inflammation in various forms may account for the majority of concurrent upper GI lesions in South Indian cholelithiasis patients. [16] Khedkar et al likewise reported that the stomach was the most common site of OGD pathology, identified in 72.5% of patients with findings, consistent with the preponderance of gastritis observed in our series. [17]

Duodenitis was the second most frequent finding in the present study (25.9%), and together these two diagnoses accounted for the majority of significant lesions. Reflux esophagitis (11.6%) was comparable to the 11–13% reported in the Thybusch et al series, while hiatus hernia (9.8%) was slightly higher than the approximately 6% incidence documented by Dhaliwal et al. [13,14]

Gastric and duodenal ulcers were rare (1.8% each), consistent with studies from similar settings and with the findings of Anandaravi et al, who reported gastric and duodenal ulcers in 7% of their endoscopy-positive patients. [16]

The principal clinical implication of these findings concerns the role of preoperative endoscopy in the management

pathway for symptomatic cholelithiasis. Gallstone disease clinical symptoms are complex and may mimic other upper GI conditions. If preoperative endoscopy identifies a treatable condition—such as peptic ulcer disease or severe reflux esophagitis—medical treatment of that condition may resolve the patient's symptoms without recourse to cholecystectomy, thereby reducing operative rates. Furthermore, for those who do proceed to surgery, treating concurrent pathology preoperatively should reduce the incidence of postoperative symptom persistence, a common source of patient dissatisfaction following cholecystectomy. [6-9]

High rates of positive findings in upper gastrointestinal endoscopy suggest that surgery is sometimes performed inappropriately in patients whose symptoms were not related to biliary stones. The coexistence of upper GI pathology should be taken into consideration when deciding the treatment plan for individual patients. Zackria et al., in a comprehensive review of postcholecystectomy syndrome, similarly emphasised that the more secure the preoperative diagnosis and the more completely co-existing conditions are identified and addressed before surgery, the lower the expected incidence of post-cholecystectomy symptom persistence. [19] These considerations together support the recommendation that upper GI endoscopy be made a routine component of the preoperative workup in all gallstone disease patients prior to elective surgical cholecystectomy. [19]

Limitations:

This study has several limitations. The retrospective design precludes assessment of causality, and the absence of a control group of non-cholelithiasis dyspeptic patients prevents direct comparison of endoscopic findings between groups. The relatively small sample size and single-centre setting limit generalizability. All patients proceeded to cholecystectomy and were not followed up postoperatively, so the effect of medical treatment of co-existing lesions on symptom resolution could not be assessed. Future prospective studies with appropriate control arms, larger sample sizes, and postoperative follow-up are needed to establish definitive recommendations for routine preoperative endoscopy in this population.

CONCLUSION

The prevalence of significant upper GI endoscopic findings in patients with ultrasound-proven symptomatic cholelithiasis and chronic dyspepsia is high (73.2%) in this South Indian tertiary centre cohort, exceeding rates reported in most Western series. Gastritis is the most prevalent single diagnosis, reflecting regional dietary and infective patterns. Significant lesions are more common in females and increase in frequency with advancing age. These findings support the routine use of upper gastrointestinal endoscopy as a preoperative investigation in all patients with symptomatic gallstone disease, to identify concurrent treatable pathology, rationalise surgical decision-making, and reduce postoperative symptom persistence.

Declarations:

Conflict of interest statement: All authors declare no conflicts of interest.

Author contributions: All authors contributed to study conception and design, data collection, data analysis, manuscript preparation, and critical revision. All authors approved the final version.

Funding: This study received no funding from any source.

Reporting guidelines: This study was conducted and reported in accordance with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist for observational studies.

Ethical considerations: Ethical approval was obtained from the Institutional Ethics Committee at Government Stanley Medical College and Hospital, Chennai, Tamil Nadu, India. All participants provided written informed consent prior to enrolment. No patient identifiers are included in this manuscript.

REFERENCES

1. Borch K, Jonsson KA, Zdzisek JM, et al. Prevalence of gallstone disease in a Swedish population sample. Relations to occupation, childbirth, health status, life style, medications, and blood lipids. *Scand J Gastroenterol* 1998;33:1219-1225.
2. Romero Y, Thistle JL, Longstreth GF, et al. A questionnaire for the assessment of biliary symptoms. *Am J Gastroenterol* 2003;98:1042-1051.
3. Schirmer BD, Winters KL, Edlich RF. Cholelithiasis and cholecystitis. *J Long Term Eff Med Implants* 2005;15:329-338.
4. Stinton LM, Shaffer EA. Epidemiology of gallbladder disease: cholelithiasis and cancer. *Gut Liver* 2012;6:172-187.
5. Kraag N, Thijs C, Knipschild P. Dyspepsia—how noisy are gallstones? A meta-analysis of epidemiologic studies of biliary pain, dyspeptic symptoms, and food intolerance. *Scand J Gastroenterol* 1995;30:411-421.
6. Berger MY, Olde Hartman TC, Bohnen AM. Abdominal symptoms: do they disappear after cholecystectomy? *Surg Endosc* 2003;17:1723-1728.
7. Glambek I, Arnesjo B, Soreide O. Correlation between gallstones and abdominal symptoms in a random population. Results from a screening study. *Scand J Gastroenterol* 1989;24:277-281.
8. Halldestam I, Kullman E, Borch K. Defined indications for elective cholecystectomy for gallstone disease. *Br J Surg* 2008;95:620-626.
9. Fenster LF, Lonborg R, Thirlby RC, et al. What symptoms does cholecystectomy cure? Insights from an outcomes measurement project and review of the literature. *Am J Surg* 1995;169:533-538.
10. Ure BM, Troidl H, Spangenberg W, et al. Evaluation of routine upper digestive tract endoscopy before laparoscopic cholecystectomy. *Br J Surg* 1992;79:1174-1177.
11. Yavorski CC, Acosta JA, Ragland JJ. Precholecystectomy esophagogastro-duodenoscopy: is it of value? *Am Surg* 1995;61:1032-1034.
12. Schwenk W, Bohm B, Badke A, et al. Preoperative esophago gastro-duodenoscopy before elective surgery for symptomatic cholelithiasis. *Leber Magen Darm* 1992;22:225-229.
13. Thybusch A, Schaub H, Schweizer E, et al. Significant value and therapeutic implications of routine gastroscopy before cholecystectomy. *J Chir (Paris)* 1996;133:171-174.
14. Dhaliwal HS, Dhaliwal RA, Gupta SC. Role of upper gastrointestinal endoscopy before cholecystectomy in patients with symptomatic cholelithiasis. *J Indian Med Assoc* 1996;94:175-177.
15. Rashid F, Rashid N, Waraich N, et al. Role of routine esophagogastro-duodenoscopy before cholecystectomy. *Int J Surg* 2010;8:236-238.
16. Anandaravi BN, Deepak HL. A study on efficacy of UGI scopy in cholelithiasis patients before laparoscopic cholecystectomy. *Minim Invasive Surg* 2021;2021:8849032.
17. Khedkar I, Prasad D, Datta A. Diagnostic value of upper gastrointestinal endoscopy prior to elective laparoscopic cholecystectomy for symptomatic cholelithiasis. *Int Surg J* 2017;4:2333-2337.
18. Morrison S, Mokoena T. Routine upper gastro-intestinal tract endoscopy before elective cholecystectomy for symptomatic gallstones—justified. *Sci Rep* 2024;14:14042.
19. Zackria R, Lopez RA. Postcholecystectomy Syndrome. Treasure Island (FL): StatPearls Publishing; 2023.