e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2025; 17(5); 1064-1069

Original Research Article

Prevalence and Clinical Profile of Gastrointestinal Symptoms Following Cholecystectomy: A Cross-Sectional Observational Study

Pramod Kumar Sah[1], Prashant Mishra[2], Kshitij Srivastava[3]

[1]Associate Professor, Department of General Surgery, Darbhanga Medical College & Hospital, Bihar, India

[2]Junior Resident, Department of General Surgery, Darbhanga Medical College & Hospital, Bihar, India

[3]Junior Resident, Department of Psychiatry, Kasturba Medical College Mangalore, Manipal Academy of Higher Education, Karnataka, Manipal, India

Received: 24-03-2025 / Revised: 23-04-2025 / Accepted: 03-05-2025

Corresponding Author: Dr. Prashant Mishra

Conflict of interest: Nil

Abstract:

Background: While cholecystectomy is a definitive treatment for gallbladder pathology, a significant number of patients continue to report gastrointestinal symptoms after surgery. Although laparoscopic surgery is now the norm, open cholecystectomy is still performed in certain contexts, particularly in resource-limited or complicated surgical settings. Understanding the prevalence and pattern of postoperative symptoms in such patients is essential for improving clinical outcomes.

Objective: To evaluate the prevalence, type, and severity of gastrointestinal symptoms among patients who underwent open cholecystectomy at least three months prior.

Methods: This cross-sectional observational study was conducted at Darbhanga Medical College and Hospital. Thirty adult patients who underwent open cholecystectomy were recruited and assessed using validated tools, including the Rome IV criteria and Dyspepsia Severity Score (DSS). Data on demographics, comorbidities, surgical history, and postoperative medications were collected and analyzed using descriptive and inferential statistics.

Results: All 30 patients underwent open cholecystectomy. The mean age was 46.3 years (range: 25–70), with a female predominance (63.3%). The most prevalent symptoms were bloating (60%), abdominal discomfort (56.6%), and dyspepsia (50%). Early satiety (36.6%), diarrhea (30%), nausea (20%), constipation (13.3%), and vomiting (10%) were also reported. Five patients (16.6%) had severe symptoms impacting daily function. Diabetes mellitus and hypothyroidism were associated with higher symptom prevalence. Postoperative use of bile acid sequestrants showed benefit in some patients.

Conclusion: Gastrointestinal symptoms are highly prevalent following open cholecystectomy. Recognizing symptom patterns and incorporating individualized follow-up care, including dietary advice and pharmacological support, may enhance long-term patient outcomes.

Keywords: Open Cholecystectomy, Post-Cholecystectomy Syndrome, Dyspepsia, Bloating, Gastrointestinal Symptoms, Rome IV.

Introduction

Cholecystectomy, the surgical removal of the gallbladder, is among the most frequently performed abdominal surgeries globally. While laparoscopic cholecystectomy is now the standard approach, open cholecystectomy continues to be performed in many parts of the world due to patient factors, complicated gallbladder disease, or limited access to minimally invasive surgical infrastructure.

Postoperative recovery is generally favorable, with significant relief from biliary colic and other gallstone-related symptoms. However, a considerable proportion of patients—particularly those undergoing open surgery—report persistent or new-onset gastrointestinal symptoms, collectively referred to as post-cholecystectomy syndrome. These include abdominal discomfort, bloating, dyspepsia, flatulence, diarrhea, constipation, and, in some cases, nausea or vomiting. The burden of these symptoms can negatively affect quality of life and patient satisfaction.

The etiology of these symptoms is multifactorial. One major contributing factor is the continuous flow of bile into the duodenum following gallbladder removal, potentially resulting in bile acid malabsorption and subsequent diarrhea. In addition, open surgery often entails more extensive

manipulation of intra-abdominal tissues, leading to transient or persistent disturbances in intestinal motility, adhesions, or altered neurohormonal feedback.

Patients with predisposing comorbidities—such as diabetes mellitus (autonomic neuropathy), hypothyroidism (intestinal hypomotility), or irritable bowel syndrome (IBS)—may experience exacerbated symptoms. Despite these issues, most literature focuses on outcomes following laparoscopic surgery. The symptom burden specifically following open cholecystectomy remains under-investigated.

This study was designed to assess the prevalence, type, and severity of gastrointestinal symptoms in patients at least three months post–open cholecystectomy, along with an evaluation of clinical associations. By understanding symptom patterns and contributing factors, clinicians can better counsel patients preoperatively and offer targeted interventions postoperatively.

Materials and Methods

Study Design and Setting: A cross-sectional observational study was conducted at the Department of General Surgery, Darbhanga Medical College and Hospital, a tertiary care teaching center in Bihar, India.

Study Duration and Sample Size: The study was conducted over a period of six months. A total of 30 patients who had undergone open cholecystectomy at least three months prior were recruited based on convenience sampling.

Eligibility Criteria:

- **Inclusion Criteria:**
  - Adults ≥18 years of age.
  - Underwent open cholecystectomy ≥3 months prior to evaluation.
  - Provided informed consent.
  - Able to respond to symptom questionnaires.
- **Exclusion criteria:**
  - Pre-existing peptic ulcer disease, inflammatory bowel disease, or known malabsorption syndromes.
  - Major postoperative complications (e.g., bile duct injury).
  - Cognitive impairment limiting valid responses.

Data Collection: Patients were evaluated using a structured clinical proforma, which included:

- Demographic data (age, sex)
- Comorbidities (diabetes, hypothyroidism, IBS)
- Time since surgery
- Medication history (especially bile acid binders)

Gastrointestinal symptoms were assessed using:

1. Rome IV Criteria – for evaluating functional gastrointestinal disorders (e.g., dyspepsia, diarrhea, constipation).
2. Dyspepsia Severity Score (DSS) – to rate frequency and impact of symptoms such as bloating, pain, early satiety, and nausea.

Symptom severity was graded as:

- Mild: Minimal interference with daily life
- Moderate: Occasional disruption of routine
- Severe: Frequent symptoms significantly impacting quality of life

Statistical Analysis: Descriptive statistics were used to report symptom prevalence and clinical features. Chi- square or Fisher's exact test was used for subgroup comparisons (e.g., symptom severity vs comorbidities). A p-value <0.05 was considered statistically significant.

Results

Figure 1: Symptom Prevalence Post-Open Cholecystectomy (n=30)

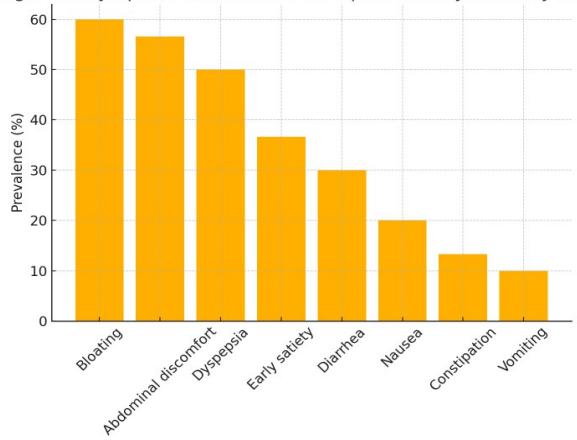
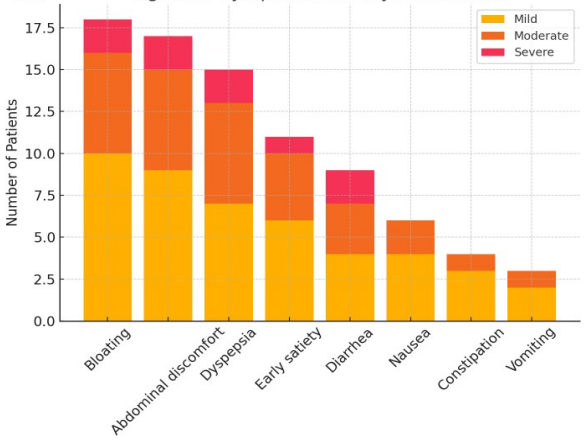
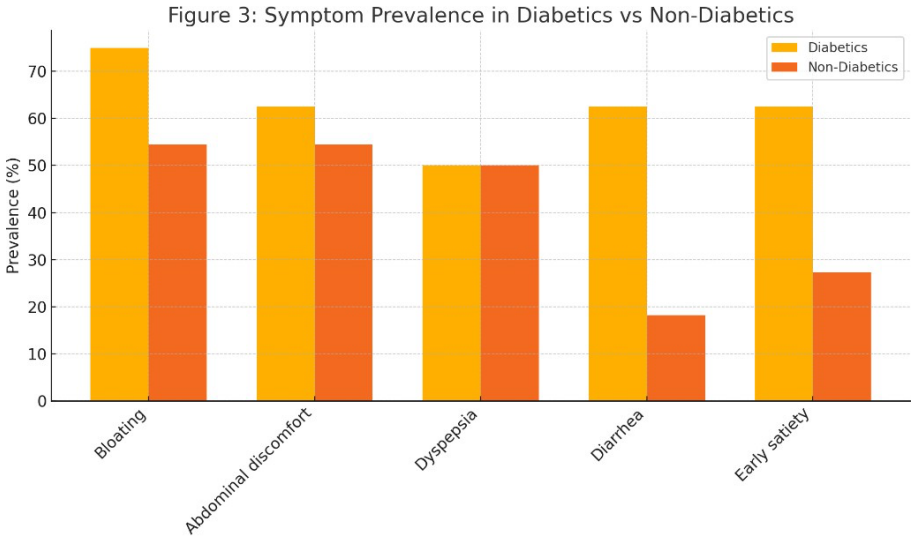


Figure 2: Symptom Severity Distribution





As depicted in Figure 1, bloating was the most commonly reported symptom, affecting 60% of the cohort, followed closely by abdominal discomfort (56.6%) and dyspepsia (50%). Early satiety and diarrhea were also prominent, particularly among individuals with comorbidities. These findings highlight the broad range of gastrointestinal disturbances experienced after open cholecystectomy, many of which persist well beyond the immediate postoperative period.

Figure 2 illustrates the distribution of symptom severity among the affected patients. While the majority of symptoms were rated as mild to moderate, a notable subset (16.6%) experienced severe symptoms that significantly interfered with daily life. Bloating, abdominal pain, and diarrhea were the most frequently reported severe symptoms. This gradation in symptom intensity underscores the need for tailored management strategies post-surgery, rather than assuming uniform recovery experiences.

Further subgroup analysis revealed important clinical associations. As shown in Figure 3, patients with diabetes mellitus exhibited a significantly higher prevalence of diarrhea (62.5%) and early satiety (62.5%) compared to non-diabetic patients. These differences may be attributed to diabetic autonomic neuropathy affecting gastrointestinal motility. Even dyspepsia and bloating were marginally more common in the diabetic subgroup, suggesting that underlying metabolic or neuroenteric factors may exacerbate post-cholecystectomy outcomes.

Demographic and Clinical Characteristics:

All 30 patients included in the study had undergone open cholecystectomy. The mean age was 46.3 years (range 25–70). The study population comprised 19 females (63.3%) and 11 males (36.7%). The mean time since surgery was 9.1 months (range 3–24 months).

Comorbidities were present in several patients:

- Diabetes mellitus: 8 (26.6%)
- Hypothyroidism: 3 (10%)
- IBS: 2 (6.6%)
- Use of bile acid sequestrants: 5 (16.6%)

Table 1: Demographic and Clinical Characteristics (n = 30)

Characteristic	Value
Mean age (years)	46.3
Age range (years)	25–70
Gender	19 females (63.3%), 11 males (36.7%)
Time since surgery (months)	Mean 9.1 (range 3–24)
Diabetes mellitus	8 patients (26.6%)
Hypothyroidism	3 patients (10%)
Irritable bowel syndrome	2 patients (6.6%)
Bile acid sequestrants used	5 patients (16.6%)

Table 2: Symptom Prevalence and Severity

Symptom	Prevalence (%)	Mild	Moderate	Severe
Bloating	18 (60%)	10	6	2
Abdominal discomfort	17 (56.6%)	9	6	2
Dyspepsia	15 (50%)	7	6	2
Early satiety	11 (36.6%)	6	4	1
Diarrhea	9 (30%)	4	3	2
Nausea	6 (20%)	4	2	0
Constipation	4 (13.3%)	3	1	0
Vomiting	3 (10%)	2	1	0

Subgroup Observations:

- Diabetic patients had significantly higher rates of diarrhea and early satiety ($p<0.05$).
- Patients with hypothyroidism more frequently reported constipation and bloating.
- All patients using bile acid sequestrants reported reduction in diarrhea frequency.

Discussion

This study provides valuable insight into the prevalence and clinical profile of gastrointestinal symptoms in patients who underwent open cholecystectomy, a population less frequently studied in the current era of minimally invasive surgery. Our findings reveal that a significant proportion of patients—nearly 70%—experience persistent or new-onset gastrointestinal complaints even several months after surgery.

Prevalence and Pattern of Symptoms

The most commonly reported symptoms were bloating (60%), abdominal discomfort (56.6%), and dyspepsia (50%), consistent with the post-cholecystectomy symptom spectrum described in prior literature. Other notable complaints included early satiety (36.6%), diarrhea (30%), and nausea (20%). These symptoms can significantly impact daily function and quality of life, particularly when moderate to severe.

While symptom patterns are similar to those reported in laparoscopic cohorts, their frequency and severity appear slightly higher in our open surgery cohort. This may reflect greater peritoneal handling, longer recovery periods, and possible postoperative adhesion formation associated with open techniques. Open cholecystectomy is also more commonly performed in cases with complicated gallbladder disease, which may contribute to more intense postoperative sequelae.

Comparison with Previous Studies

Studies have shown that 20%–60% of patients may experience gastrointestinal disturbances post-cholecystectomy. Portincasa et al. (2006) and Weinberg et al. (2013) have noted that bile acid malabsorption, sphincter of Oddi dysfunction, and motility disturbances contribute to symptoms postoperatively. Our findings fall well within this range but provide a focused lens on open surgery, which is rarely highlighted independently.

Previous work by Thompson and Heaton (1980) emphasized that the removal of the gallbladder alters the kinetics of bile delivery, resulting in a continuous trickle of bile into the intestine, which may overwhelm absorptive capacity and contribute to bile acid-induced diarrhea. In our study, 30% of patients experienced diarrhea, with two cases rated as severe. This symptom was more common among diabetic patients, likely due to autonomic dysregulation and altered gut transit.

Comorbidity Associations

A notable finding was the higher symptom burden among patients with diabetes mellitus and hypothyroidism. Autonomic neuropathy in diabetes may delay gastric emptying and impair intestinal motility, contributing to bloating, early satiety, and diarrhea. Similarly, hypothyroidism is associated with hypomotility and constipation, reflected in our results where all hypothyroid patients reported at least one GI symptom.

Therapeutic Insights

Among the five patients prescribed bile acid sequestrants, four reported symptomatic relief, particularly from diarrhea and bloating. This reinforces the hypothesis that bile acid malabsorption plays a substantial role in post-cholecystectomy symptomatology.

Cholestyramine and similar agents can be valuable adjuncts in this setting and should be considered in patients presenting with post-surgical diarrhea.

Clinical Implications

Our findings suggest that patients undergoing open cholecystectomy may be at greater risk for persistent GI symptoms than those undergoing laparoscopic procedures. Preoperative counseling should include discussion of this risk, and postoperative follow-up should incorporate structured symptom screening, possibly using standardized tools like the Rome IV questionnaire or the Dyspepsia Severity Score.

A practical approach might include:

- Low-fat dietary recommendations post-surgery.
- Early consideration of bile acid sequestrants in cases of chronic diarrhea.
- Probiotics and prokinetics in cases of bloating or dyspepsia.
- Individualized follow-up, especially in patients with diabetes or thyroid dysfunction.

Strengths and Limitations

Strengths:

- Focused exclusively on open cholecystectomy, a less frequently studied subgroup.
- Use of standardized symptom assessment tools (Rome IV, DSS).
- Clinical relevance to low-resource settings where open surgery remains common.

Limitations:

- Modest sample size (n = 30) limits generalizability.
- Cross-sectional design; no baseline (pre-surgery) symptom assessment.
- Single-center study; institutional practices may influence outcomes.

Despite these limitations, the study fills a critical gap in the literature and sets the foundation for future prospective investigations comparing open and laparoscopic cohorts directly.

Conclusion

Gastrointestinal symptoms are common and often under-recognized in patients following open cholecystectomy, with bloating, abdominal discomfort, and dyspepsia being the most frequent complaints. Comorbid conditions such as diabetes and hypothyroidism may predispose individuals to more severe or persistent symptoms. This study highlights the importance of proactive, individualized postoperative care to identify and manage these symptoms effectively.

Preoperative counseling should include a discussion of possible long-term GI issues, particularly in patients with high-risk profiles. Postoperative strategies such as bile acid sequestrants, dietary modifications, and symptom-targeted medications may improve outcomes. Larger, multicentric, and prospective studies are warranted to further delineate the symptom trajectory and evaluate long-term therapeutic strategies in this population.

References

1. Shaffer EA. Gallstone disease: Epidemiology of gallbladder stone disease. Best Pract Res Clin Gastroenterol. 2006;20(6):981–96.
2. Portincasa P, Moschetta A, Palasciano G. Postcholecystectomy syndrome: From pathophysiology to prevention. Best Pract Res Clin Gastroenterol. 2006;20(6):1117– 35.
3. Weinberg DS, Smoot RL, Menees SB, Stoffel EM. Post-cholecystectomy symptoms: the "missing gallbladder" syndrome. Gastrointest Endosc Clin N Am. 2013;23(2):385–403.
4. Yu T, Zhang X, Shi C, Qian L, Yin X, Xiao Y. Pathogenesis of diarrhea after cholecystectomy. Gastroenterol Res Pract. 2018; 2018:8284371.
5. Berger MY, van der Velden JJ, Lijmer JG, de Kort H, Prins A, Bohnen AM. Abdominal symptoms: Do they predict gallstones? A systematic review. Scand J Gastroenterol. 2000;35(1):70–6.
6. Thompson JS, Heaton KW. Disorders of the large intestine after cholecystectomy: An unresolved problem. Gastroenterology. 1980;79(4):534–8.
7. Corazziari E, Shaffer EA. Functional disorders of the biliary tract and pancreas. Gut. 1997;41(1):113–7.
8. Lacy BE, Weiser K, Kennedy A, Crowell MD, Talley NJ. Functional dyspepsia: The economic impact to patients. Aliment Pharmacol Ther. 2013;38(2):170–7.
9. Tack J, Talley NJ, Camilleri M, Holtmann G, Hu P, Malagelada JR, et al. Functional gastroduodenal disorders. Gastroenterology. 2006;130(5):1466–79.
10. Gallstones and biliary tract disease. In: Feldman M, Friedman LS, Brandt LJ, editors. Sleisenger and Fordtran's Gastrointestinal and Liver Disease. 10th ed. Philadelphia: Elsevier Saunders; 2016. p. 1187–216.
11. Ruhl CE, Everhart JE. Gallstone disease is associated with increased mortality in the United States. Gastroenterology. 2011;140(2):508–16.
12. Stinton LM, Shaffer EA. Epidemiology of gallbladder disease: Cholelithiasis and cancer. Gut Liver. 2012;6(2):172–87.
13. Bharucha AE, Camilleri M, Low PA, Zinsmeister AR. Autonomic dysfunction in gastrointestinal motility disorders. Gut. 2001;49(6):763–6.
14. Venneman NG, van Erpecum KJ. Gallstone disease: Primary and secondary prevention. Best Pract Res Clin Gastroenterol. 2006;20(6):1063–73.
15. Funch-Jensen P. Clinical evaluation of sphincter of Oddi function. Gut. 2000;47(Suppl 4):iv60–3.
16. American College of Gastroenterology Functional GI Disorders Task Force. ACG Clinical Guideline: Diagnosis and management of functional dyspepsia. Am J Gastroenterol. 2017;112(7):988–1013.
17. Camilleri M. Bile acid diarrhea: Prevalence, pathogenesis, and therapy. Gut Liver. 2015;9(3):332–9.
18. Lammert F, Sauerbruch T. Mechanisms of disease: The genetic epidemiology of

gallbladder stones. Nat Clin Pract Gastroenterol Hepatol. 2005;2(9):423–33.
19. Festi D, Reggiani MLB, Attili AF, Loria P, Pazzi P, Scaioli E, et al. Natural history of gallstone disease: Expectant management or active treatment? A population-based cohort study. J Gastroenterol Hepatol. 2010;25(4):719–24.
20. Halldestam I, Kullman E, Borch K. Incidence of postcholecystectomy symptoms: A prospective study of 107 patients. Acta Chir Scand. 1991;157(7):441–6.