

A Cohort Follow-Up Study to Determine the Occurrence of Diarrhea in Post Laparoscopic Cholecystectomy Patients

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ABSTRACT

Introduction: Laparoscopic cholecystectomy (LC) is the standard treatment for symptomatic gallstones. Despite notable benefits of cholecystectomy in treating gallstone related disease, the postoperative course may be affected by persistent or even new symptoms, including new onset diarrhea. Data on the effect of cholecystectomy on bowel function is sparse. The aim of this study is to determine the incidence of postcholecystectomy diarrhea (PCD) and to identify management patterns.

Methods: In 253 consecutive patients who underwent laparoscopic cholecystectomy, data was obtained from clinical records and telephonic survey 3 months postoperatively using standardized questionnaires. Out of 253 subjects 248 patients were telephonically responsive and 5 patients were lost to follow up.

Results: Among 248 patients 25 patients had diarrhea (12 mild, 10 moderate, 3 severe) and it was more common in men. The prevalence of diarrhea in post laparoscopic cholecystectomy patients is 10%. Twelve patients got relieved from constipation after LC. Treatment of diarrhea was empirical and included antimotility agents plus probiotics, antimicrobial agents plus probiotics.

Conclusion: Investigation for bile acid diarrhea was proposed

for severe symptoms. The relationship between cholecystectomy and PCD is an undeniable fact with 10% of patients reporting trouble-some new onset diarrhea.

Keywords: Laparoscopic Cholecystectomy, Bile Acid Diarrhea, Gallstones.

Abbreviations:

PCD: Post cholecystectomy diarrhea; **LC:** Laparoscopic cholecystectomy; **BAD:** Bile acid diarrhea; **GI:** Gastrointestinal; **DM:** Diabetes Mellitus; **HTN:** Hypertension; **CAD:** Coronary artery disease; **CKD:** Chronic kidney disease.

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Article History:

Received: 20-02-2023, **Revised:** 02-03-2023, **Accepted:** 17-03-2023

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2023.9.2.001	

INTRODUCTION

Cholecystectomy is a common surgical procedure performed for the treatment of symptomatic cholelithiasis.¹The laparoscopic approach is now well documented and accepted as standard practice, in view of lower morbidity and mortality when compared with open surgery.² The majority of patients after a cholecystectomy are satisfied with their outcomes, but some patients develop bothersome symptoms like diarrhea which could impact the quality of life. A limited number of patients may complain about constipation.^{3,4} Most studies are not specifically powered to evaluate post-cholecystectomy diarrhea, which leads to a significant variability in the literature.⁵ There is also a paucity of Indian literature in this area.

Post-cholecystectomy diarrhea may be potentially triggered by more bile acid being delivered to the large bowel.⁶ Furthermore,

implicated mechanisms in the onset of this condition remain significantly under-investigated.^{7,8}

In this study we aimed to accurately determine the frequency of development of diarrhea after cholecystectomy and management of post cholecystectomy diarrhea from past study reports. In addition, we also aimed to find whether patients experience relief of pre-existing constipation.

METHODS

A cohort longitudinal study with a sample population of 253 patients diagnosed with gallstones and admitted to the Gastroenterology Department for laparoscopic cholecystectomy were studied from Jan 2022 to Dec 2022 at Yashoda hospital, Secunderabad. The study received approval from the Institutional

Ethics Committee and verbal consent was obtained from research participants before telephonic interviews. Data collection included review of hospital and outpatient records and a telephonic survey. Pre-operative and post-operative symptoms and outcomes were assessed after a detailed telephonic questionnaire at 3 months after LC. All patients who accepted to be a part of the study were included. Our study included patients who underwent LC of age group (18-70) both male and female. Subjects below 18 years, diagnosed with GI cancers, lactating women, multiple surgeries (within 3 months) were excluded. We interviewed the patients by telephone 1 week after the operation and again 3 months later to complete the standardized questionnaires to establish the effect of LC on gastrointestinal tract and bowel habits. The subjects were interviewed about the defecation frequency, fecal consistency, bloating, pain pattern and dietary pattern. Fecal consistency was based on a seven point (Bristol stool chart). During the interview, all medications used for diarrhea were classified accordingly. Statistical analysis was carried out using SPSS Statistical Analysis System software version 20 including chi square test, t-test and compared for significance ($p < 0.05$). Graphs and charts were mainly represented with bar and pie diagrams.

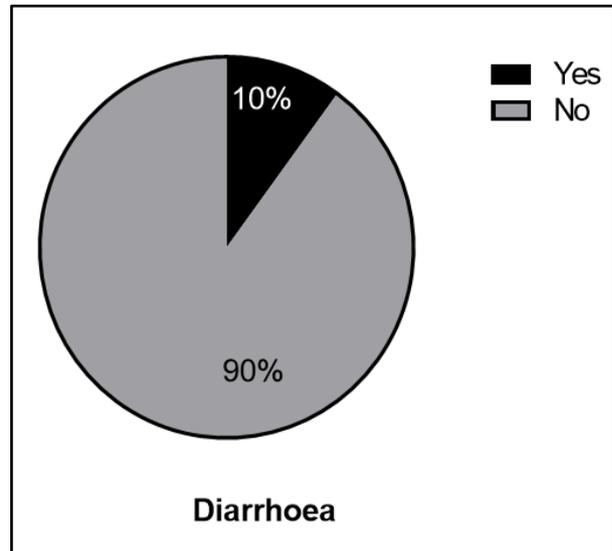


Figure 1: Prevalence of diarrhea in post laparoscopic cholecystectomy patients

Table 1: Age wise distribution among PCD patients

Age Interval (years)	n=25	Percentage
21-30	01	04
31-40	05	20
41-50	02	08
51-60	07	28
61-70	06	24
71- 80	02	08
81- 90	02	08

Mean± SD is 55.96± 15.46

Table 2: Percentage of severity of diarrhea

Severity	n=25	Percentage
Mild	12	48
Moderate	10	40
Severe	03	12

Table 3: P-values for stool consistency among PCD patients

Stool Consistency	Visit			P value
	Pre op	Post op	Follow up	
Type 1	2(8)	2(8)	0	0.0349
Type 2	5(20)	2(8)	4(16)	
Type 3	11(44)	4(16)	5(20)	
Type 4	5(20)	2(8)	5(20)	
Type 5	2(8)	8(32)	7(28)	
Type 6	0	7(28)	4(16)	

Table 4: P-value based on abdominal bloating

Abdominal bloating	Visit			P value
	Pre op	Post op	Follow up	
Yes	20(77)	11(41)	10(41)	0.0075
No	5(23)	14(59)	15(59)	

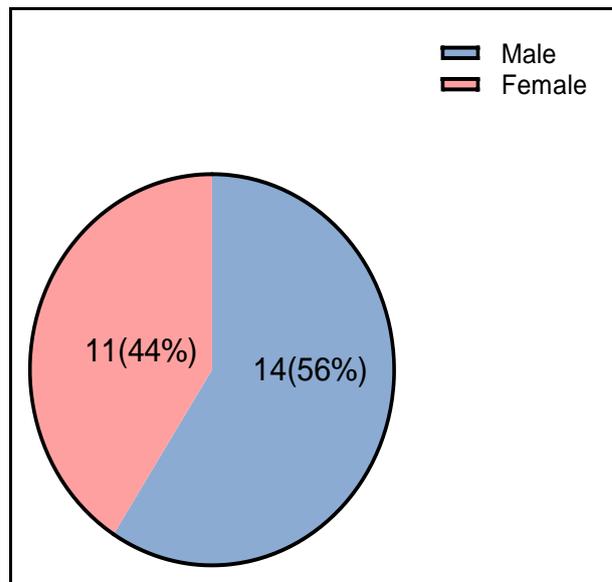


Figure 2: Gender-wise distribution in diarrhea patients

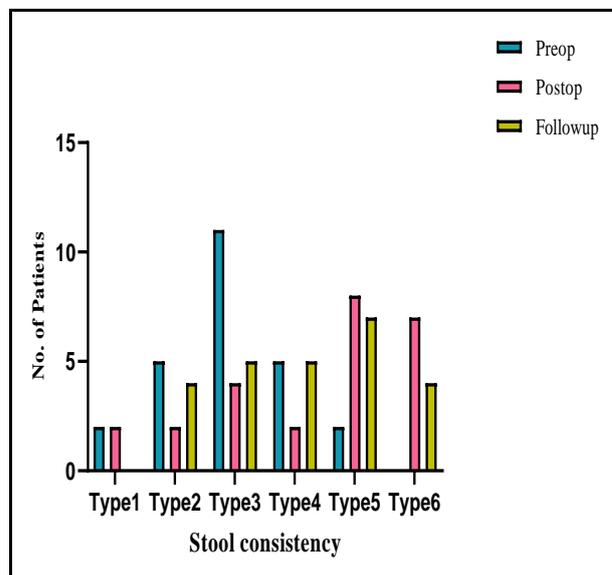


Figure 3: Stool consistency among diarrheal patients among PCD patients

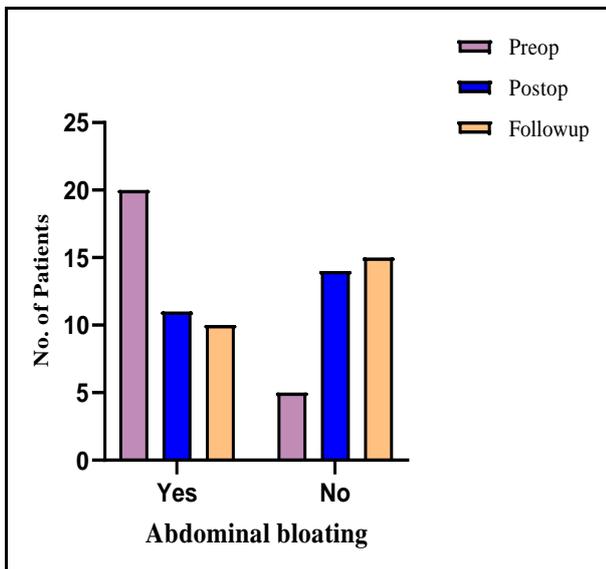


Figure 4: Trouble-some abdominal bloating in post cholecystectomy patients with diarrhea.

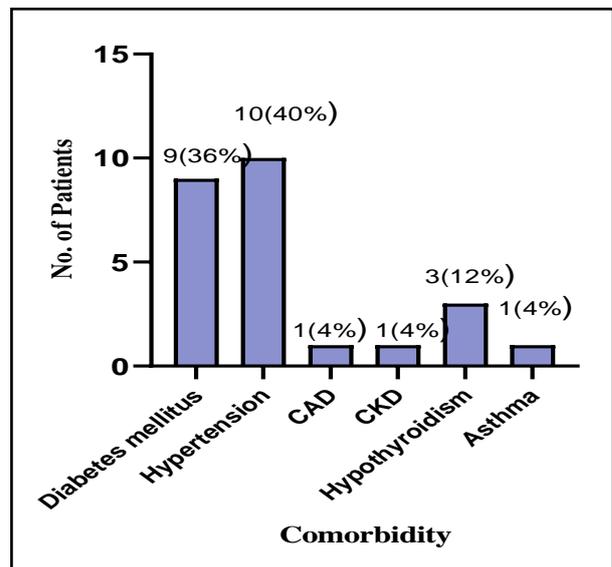


Figure 7: Co morbidities among PCD patients

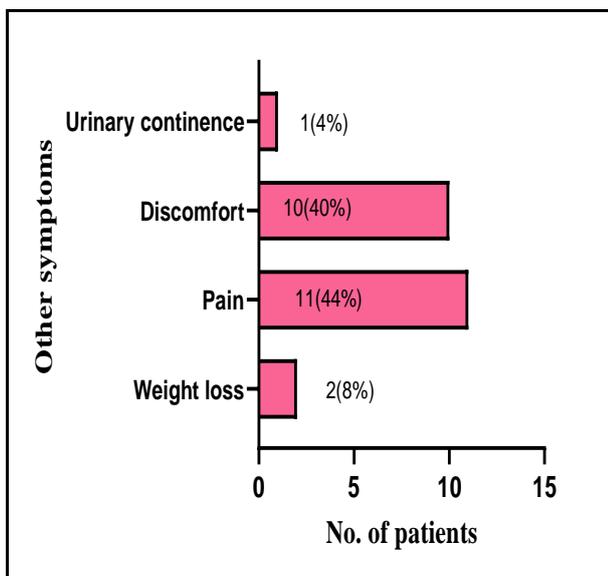


Figure 5: Other symptoms among diarrheal patients

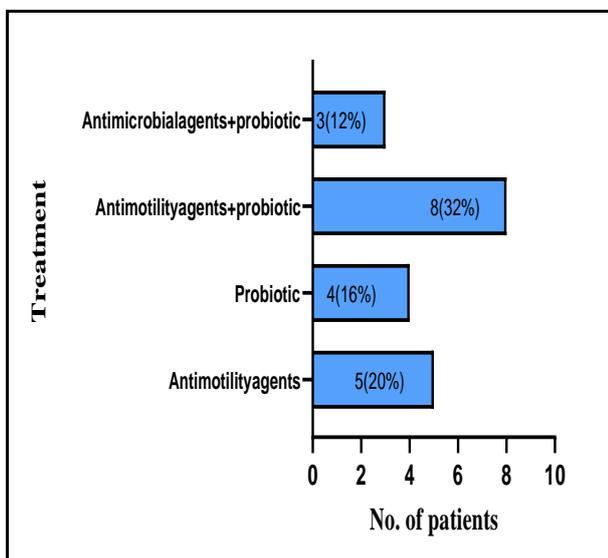


Figure 6: Different treatment patterns in patients showing diarrheal symptoms

RESULTS

Among 248 patients, 25 patients had post cholecystectomy diarrhea. In our patients, the prevalence of diarrhea after laparoscopic cholecystectomy patients is 10% (figure1). There were 14 men (56%) and 11 women (44%) among 25 PCD patients (figure 2). Among 25 patients 4% were in the age group of 21-30 (n=1,4%) followed by 31-40 (n=2,8%), 51-60 (n=7,28%), 61-70 (n=6,24%), 71-80 (n=2,8%) (table 1).

Of these 25 patients 12 mild, 10 moderate and 3 had severe diarrhea symptoms. Most of the diarrheal symptoms were in the age group of 51-60 years (table 2).

The stool consistency among these 25 patients showed a significant variation post operatively and during follow-up of 3 months (table 3 and figure 4). Most of the patients with diarrhea had type 5 consistency according to the Bristol stool chart. A proportion of patients complained of abdominal bloating after surgery (p=0.0075) (table 5). Other symptoms included pain, discomfort and abdominal bloating (figure 6). Out of 25 PCD patients, 11 were treated with antimicrobials agents + probiotics or antimotility agents + probiotics, 9 patients were on probiotics or antimotility agents (figure7). Out of 248 surgeries, 12 (i.e 5%) patients got relieved from constipation. A few patients had co morbid illnesses constituted Diabetes (n=9, 36%) followed by Hypertension (n=10, 40%), CAD (n=1, 4%), CKD (n=1,4%), Hypothyroidism (n=3,12%) and asthma (n=1,4%) (figure 8).

DISCUSSION

The goal of the study is to evaluate the cholecystectomy outcomes specifically intended to assess how gallbladder surgery affects the bowel movements and the general prevalence of postcholecystectomy issues. Whether it is pre-existing or new onset, diarrhea is one of the most commonly reported postoperative symptoms following cholecystectomy, however it varies greatly between studies.¹⁶

The present study might be questioned for only covering a small number of participants in comparison to few other studies on the long-term consequences. Studies in the Indian population is also sparse.

Nonetheless, unselected individuals were evaluated before and after surgery, and we believe that, despite inherent patient subjectivity, such research can offer a realistic approximation of how cholecystectomy affects bowel movements, predominantly development of diarrhea.

Prior knowledge of the surgery, as well as psychological and social variables, have a significant role in what a patient anticipates from any given surgery, PCD is not a well-known entity among patient population and medical professionals involved in the care of the subjects. On the other hand, there could also be a need to evaluate bile acid diarrhea (BAD) in patients who present with severe PCD.

In the present study 253 patients underwent laparoscopic cholecystectomy during the study period and 25 of them reported diarrhea after the procedure.

Niranjan B et al, from India studied 113 individuals who underwent laparoscopic cholecystectomy for symptomatic gallstones in a single surgical center.¹⁷ In this study PCD occurred in 20% of the patients and it was a significant new symptom after the surgery. This seems to be similar in our study which indicated that 10% of patients reported more than two bowel movements per day after cholecystectomy.

Our comprehensive analysis revealed that 10% of patients developed post-cholecystectomy diarrhea as a bothersome symptom. This number is lower than what several studies have reported, which range from 12% to 20%.¹⁷⁻²⁰

In contrast, two studies stated PCD rate as low as 0%.²⁵⁻²⁷ The difference in the studies may be due to different study groups, follow-up periods, evaluation questionnaire wording, and definitions of diarrhea. Furthermore, discrepancies in the perceptions of people who were interviewed or participated in research that reported bowel habits are frequently not corroborated by objective records.

Diarrhea following cholecystectomy is probably caused by a number of factors. Among the potential causes are 1) the loss of the gall bladder's reservoir role changes bile acid kinetics. Deoxycholic acid content in the colon specifically increases and it can induce watery diarrhea 2) acceleration of colonic passage due to increased enterohepatic circulation of bile acids 3) psychological and psychosomatic factors influencing gut motility by unexplained mechanisms.^{18,33,34}

A new finding, which has been disclosed in the present study, is that a proportion of patients who underwent surgery claimed that earlier constipation (5%) was relieved. Although these preoperative features have low discriminating value, there is a need for more study in this area. Studies that have assessed the effect of age did not influence the outcome. Other published reports showed the pain is more common in patients above 55 years.

CONCLUSION

Gallstone disease symptoms greatly improve with laparoscopic cholecystectomy. In comparison to belching, flatulence, and heartburn, which are also generally eased, biliary pain, bloating, nausea, and vomiting had superior results. Many patients complained of persistent abdominal discomfort even after surgery(40%).

According to our study, 10% of individuals experienced bothersome, recent diarrhea following LC. It was discovered that

this symptom was common in the age gap between 51-70 and in men. Additionally, a significant number of patients (5%) reported that their previous constipation problem was relieved after the surgery.

It could be proposed that the patients should be counseled for the development of certain bowel symptoms like diarrhea after cholecystectomy and that this complication may be more in the elderly than in younger population. Evaluation of this diarrhea may have to be carried out in patients with severe symptoms. It also benchmarks the current clinical scenario when it comes to the investigation of chronic diarrhea after cholecystectomy. However, the relationship between cholecystectomy and chronic diarrhea is an undeniable fact.

ETHICAL APPROVAL

Institutional Ethics Committee, Yashoda Academy of Medical Education and Research (IEC-YAMER).

Reg.No. ECR/49/Inst/AP/2013/RR-22.

DHR Reg no.EC/NEW/INST/2020/1148.

An informed consent form was taken from the patients.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Ravi Shankar. B, Prasad Babu. T.L.V.D, Monisri. V, SaiSujay. V, Madhusudhan. E, Vamsi Krishna. B. A Cohort Follow-Up Study to Determine the Occurrence of Diarrhea in Post Laparoscopic Cholecystectomy Patients. *Int J Med Res Prof*. 2023 Mar; 9(2): 1-5. DOI:10.21276/ijmrp.2023.9.2.001