

## Original Research Article

# Is endoscopy a must before laparoscopic cholecystectomy?

Satish Kumar R., Burri Mohan Ram\*, Tejasvi Kumar C., Vamshi Krishna Reddy

Department of General Surgery, KIMS Hospital, Bengaluru, Karnataka, India

**Received:** 28 June 2021

**Accepted:** 03 August 2021

**\*Correspondence:**

Dr. Burri Mohan Ram,

E-mail: [dr.mohanram19@gmail.com](mailto:dr.mohanram19@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Laparoscopic cholecystectomy is common surgery performed for gall stone diseases and the gold standard procedure nowadays. But it is sometimes challenging to distinguish whether pain abdomen is due to gallstones or other UGI (upper gastro-intestinal) pathologies. Present study was conducted to rule out UGI pathologies in the patients undergoing cholecystectomy by performing UGI endoscopy as routine for effective management of the cases. The aims and objectives were to study the role of preoperative UGI endoscopy as an investigative modality to rule out UGI disorders in patients with gall stone disease.

**Methods:** The study population consisted of 100 patients admitted for the management of gall stone diseases in KIMS hospital Bengaluru between January 2018 to July 2019. UGI endoscopy was done in all the patients routinely and to look for significant pathologies and patients with upper GI pathologies were adequately treated and later laparoscopic cholecystectomy was done. Postoperative events of pain abdomen were assessed on POD (postoperative day) 7, 14, 30, 60 days.

**Results:** Out of the 100 patients in the study 55 patients (55%) had UGI pathologies on endoscopy and 30 patients (54.5%) are positive for *H. pylori*, 29 patients (52%) had persistent pain abdomen on POD 60 with p value of 0.001 which is statistically significant and 19 patients (34%) had persistent pain abdomen on POD 30 with p value <0.001 which is statistically significant.

**Conclusions:** Beside its cost effectiveness, UGI endoscopy may potentially help in reducing the incidence of postoperative persistence of symptoms. UGI endoscopy has a vital role in the initial evaluation and investigation of patients with symptomatic gall stones.

**Keywords:** Laparoscopic cholecystectomy, UGI endoscopy, UGI pathologies

### INTRODUCTION

Cholelithiasis is one of the commonest problems encountered in surgery.<sup>1</sup> In Asia, the prevalence of gallstone disease is 5-10% of population especially among older individuals and females.<sup>1</sup> The prevalence of gallstones in India is 3% to 6%.<sup>2</sup> Interestingly the prevalence of gallstones is seven times more frequent in North India than in South India and the composition of gallstones is also different in different parts India. In the North and Eastern India, gallstones are predominantly cholesterol stones and mixed stones, on the other hand, in South India, pigment stones are predominant.<sup>3</sup>

The pain due to the obstructing stone that causes sudden expansion of the gall bladder is called biliary colic.<sup>4</sup> This typical pattern of pain occurs at right upper quadrant or epigastric region and lasts between 15 mins to several hours commonly after a fatty meal. When pain gradually disappears, it leaves behind a dull ache usually with nausea and vomiting. As the supply is splanchnic nerve, pain radiates to back, right scapula or shoulder tip and occasionally to back. Any other spectrum of symptoms that does not fit typical pain criteria is considered atypical and include any abdominal discomfort, dyspepsia, nausea, belching, heart burn, food intolerance, flatulence, vomiting and loss of appetite.<sup>5</sup>

Although biliary colic was specific for gallstones, 80% of the referred patients with gallstones presented with other abdominal symptoms. There is no current evidence that justifies the use of single abdominal symptoms, other than biliary colic, in the diagnosis of symptomatic gallstones. Further research should focus on the prognosis of patients with non-specific abdominal symptoms and gallstones.<sup>6</sup> To prevent cholecystectomy for an innocent condition such as asymptomatic gallstones, one need to know the specific symptoms of gallstone disease.<sup>6</sup> In total, 80% of the patients with gallstones were referred with other abdominal symptoms. The discussion remains whether these latter patients had asymptomatic gallstones or their gallstones caused symptoms other than biliary colic.<sup>6</sup>

The group of patients with cholelithiasis with nonspecific upper GI symptoms can present with the same type of symptoms even after cholecystectomy and it is called as post cholecystectomy syndrome. This syndrome usually due to diseases which are unrelated to cholelithiasis-like gastritis, esophagitis, peptic ulcer disease and hiatus hernia. It is therefore important that an accurate documentation of atypical abdomen pain be made and patients should be treated together with surgery for cholelithiasis. Cholecystectomy surgery in patients with gallstone and nonspecific symptoms is unjustifiable, so preoperative documentation of UGI pathology is important before doing laparoscopic cholecystectomy.<sup>7</sup>

Persistent post cholecystectomy pain have been reported in 20-30% of patients.<sup>8</sup> The presence of such persistent pain is also called post cholecystectomy syndrome. The relationship between such persistent pain and cholelithiasis is often unclear. Coexistence of concurrent UGI problems with gallstones may have attributed to the post cholecystectomy syndrome. There is always an immense challenge in the evaluation of patients with UGI symptoms, who have gallstones to decide whether the stones in gallbladder are the source of the symptoms or an incidental finding.

### **Aims and objectives**

The aims and objectives were to identify the most common UGI symptoms of gall stone disease and to study the role of preoperative UGI endoscopy as an investigative modality to rule out UGI disorders in patients with USG proven gall stone disease.

### **METHODS**

In this prospective study, 100 patients with symptomatic cholelithiasis admitted in Kempegowda institute of medical sciences, Bengaluru, between February 2018 and June 2019 were initially included.

Patients of age >18 years of age and patients who had either single or multiple stones in gall bladder only as

shown in ultrasound and patients with symptoms of classical biliary colic were included in the study.

Patients less than 18 years of age, patients with acute calculous cholecystitis, chronic cholecystitis, choledocholithiasis and other gall bladder pathology, patients whose general condition was not stable, patients with haemolytic anemia, patients who had undergone cholecystectomy were excluded from the study.

100 patients with USG proved gall stones admitted in surgery department taken for the study. Details of cases were recorded including history and clinical examination and investigations as per the pretested proforma. UGI endoscopy was performed to look for significant lesions. Dyspepsia was treated accordingly and was observed for resolution. Surgery was considered in case of non-resolution of symptoms. The patients were followed up postoperatively on 7th, 14th, 30th day to evaluate the presence of postoperative symptoms.

### **Software analysis**

Data analysis was done both manually and by using computer. Calculated data were arranged in systemic manner, presented in various table and figures and statistical analysis was made to evaluate the objectives of this study with the help of statistical package for social science (SPSS).

### **RESULTS**

Since all included patients were symptomatic, UGI endoscopy was done for all 100 patients.

Among the 100 patients gall stones found to be most common between the age group of 31-40 years which was about 32%, followed by 51-60 years which was about 24% and 41-50 years which was about 23%.

45 patients out of 100 patients had normal UGI findings. 55 patients had UGI pathologies. The most being GERD (gastro esophageal reflux disease), antral gastritis, antral erosions, and oesophagitis. 2 patients had gastric ulcer, 2 patients had duodenal ulcer and 1 patient had oesophageal carcinoma. There are different UGI pathologies on endoscopy out of which the commonest was GERD 27 patients (27%), followed by antral gastritis 22 patients (22%) followed by antral erosions 11 patients (11%).

Out of the 55 patients with UGI pathologies 30 patients (54.5%) had positive RUT (rapid urease test) and 25 patients (45.4%) had negative RUT. Out of 55 patients who had UGI pathologies on endoscopy 30 patients (54.5%) had positive RUT test which implied *H. pylori* with  $p < 0.001$  which is statistically significant.

**Table 1: Distribution of study patients based on *H. pylori* findings.**

Variables	Category	N	%
<i>H. pylori</i>	Positive	30	30
	Negative	70	70

**Table 2: Comparison of association between *H. pylori* findings and UGI endoscopy findings using Chi square test.**

<i>H. pylori</i>	UGI endoscopy findings				Chi-square value	P value
	Positive		Negative			
	N	%	N	%		
Positive	30	100	0	0	35.065	<0.001*
Negative	25	35.7	45	64.3		

**Table 3: Distribution of study patients based on post-op events.**

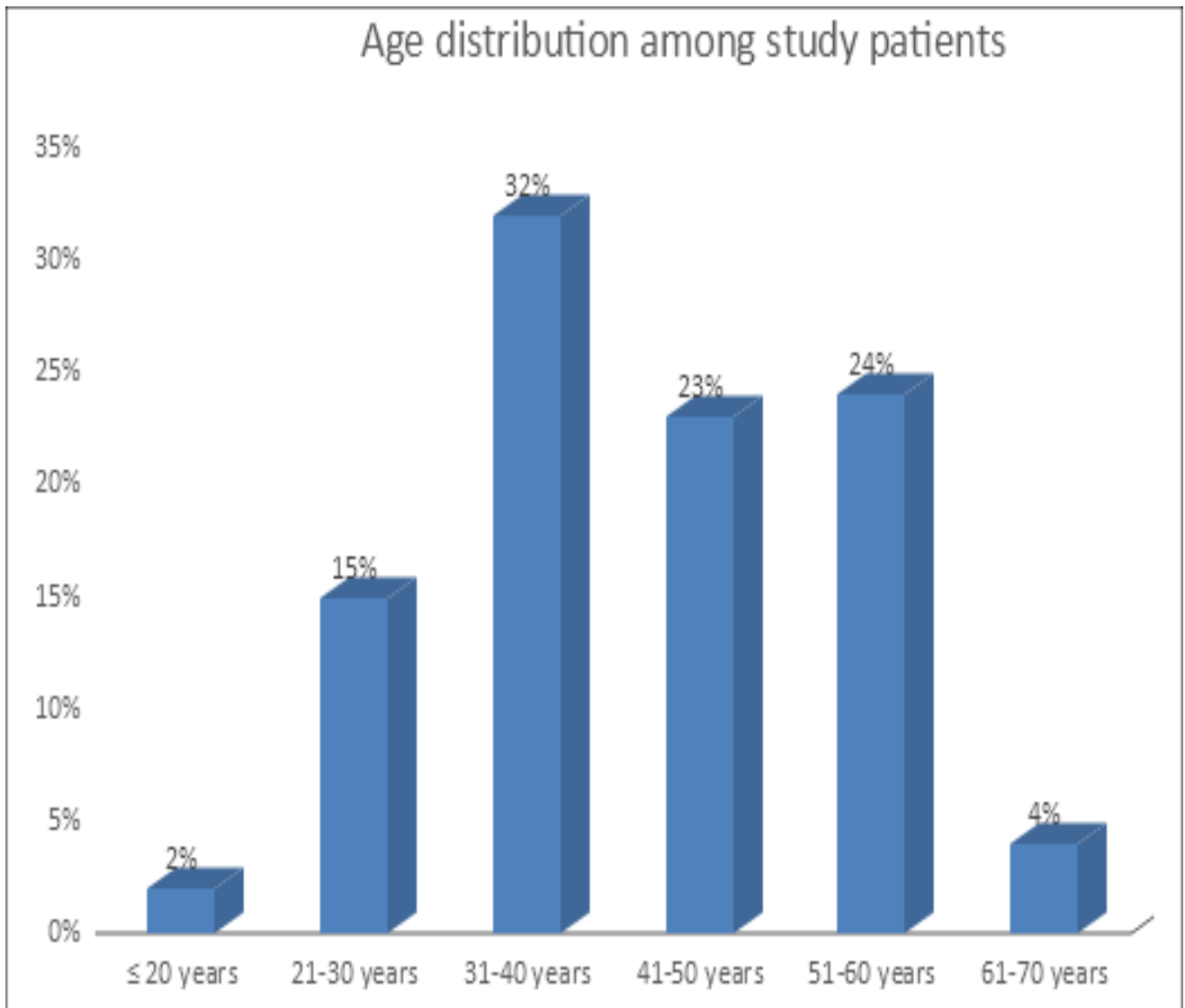
Post op time	Category	Post op events	
		N	%
Day 7	Pain abdomen	3	3.2
	Unventifful	92	96.8
Day 14	Pain abdomen	7	7.4
	Unventifful	88	92.6
Day 30	Pain abdomen	17	17.9
	Unventifful	78	82.1
Day 60	Pain abdomen	35	36.8
	Unventifful	60	63.2

**Table 4: Compassion of post-op events and UGI endoscopy findings among study patients.**

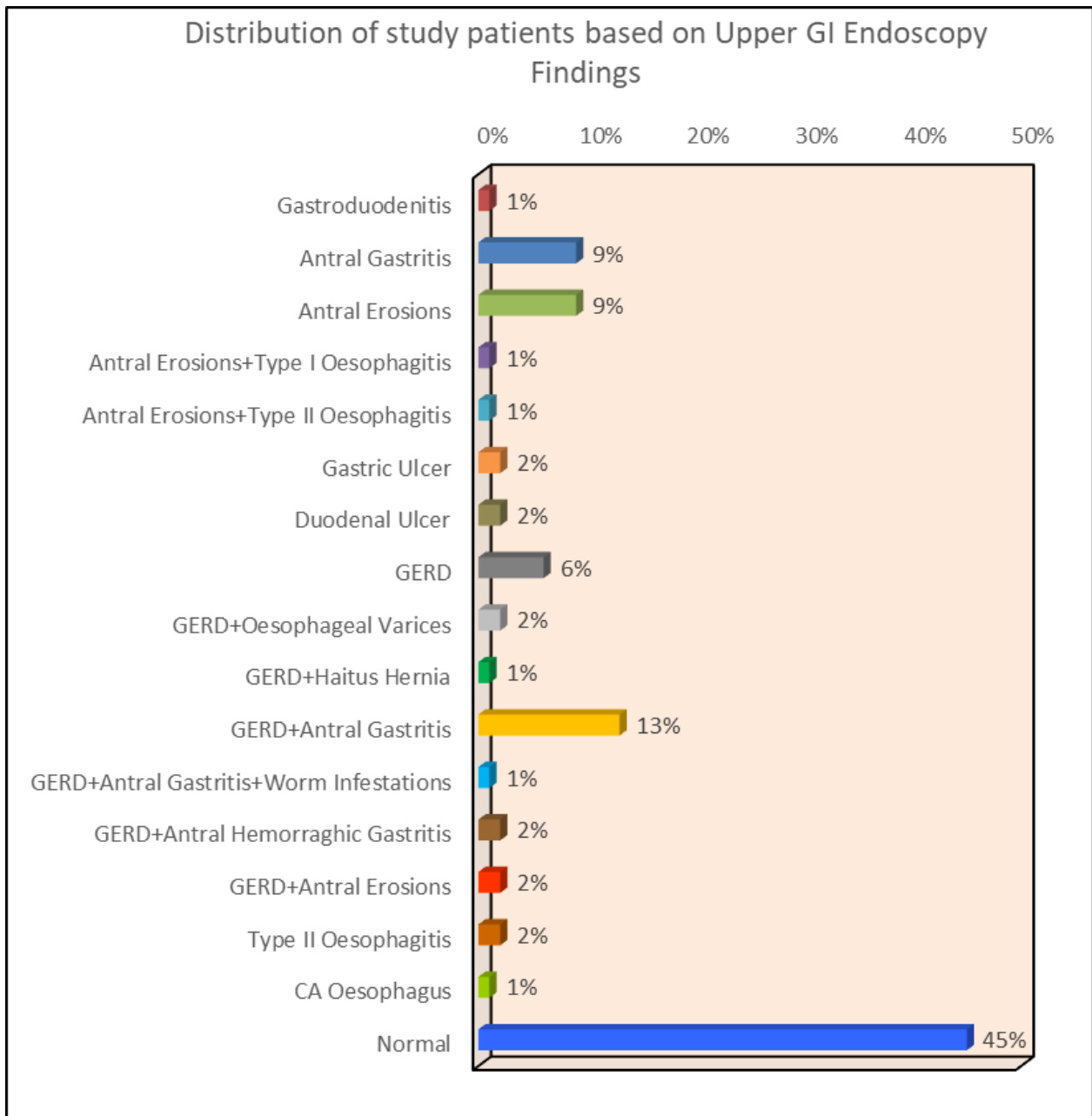
Post op time	Post op events	UGI endoscopy findings				Chi-square value	P value
		Positive		Negative			
		N	%	N	%		
Day 7	Pain abdomen	3	6.0	0	0.0	2.788	0.10
	Unventifful	47	94.0	45	100.0		
Day 14	Pain abdomen	6	12.0	1	2.2	3.317	0.07
	Unventifful	44	88.0	44	97.8		
Day 30	Pain abdomen	17	34.0	0	0.0	18.635	<0.001*
	Unventifful	33	66.0	45	100.0		
Day 60	Pain abdomen	26	52.0	9	20.0	10.423	0.001*
	Unventifful	24	48.0	36	80.0		

**Table 5: Comparison of post-op events and *H. pylori* findings among study patients.**

Post op time	Post op events	<i>H. pylori</i> findings				Chi-square value	P value
		Positive		Negative			
		N	%	N	%		
Day 7	Pain abdomen	3	12.0	0	0.0	8.674	0.003*
	Unventifful	22	88.0	70	100.0		
Day 14	Pain abdomen	3	12.0	4	5.7	1.066	0.30
	Unventifful	22	88.0	66	94.3		
Day 30	Pain abdomen	13	52.0	4	5.7	26.860	<0.001*
	Unventifful	12	48.0	66	94.3		
Day 60	Pain abdomen	16	64.0	19	27.1	10.754	0.001*
	Unventifful	9	36.0	51	72.9		



**Figure 1: Age distribution among study patients.**



**Figure 2: Distribution of study patients based on UGI endoscopy findings**

Out of the total 100 patients, 95 patients underwent laparoscopic cholecystectomy, only 5 patients out of which 2 patients had gastric ulcer, 2 patients had duodenal ulcer and 1 patient had carcinoma esophagus laparoscopic cholecystectomy was abandoned.

The post-op events of pain abdomen were assessed on POD 7, 14, 30, 60 days for the 95 patients who underwent cholecystectomy. 35 patients (36.8%) had persistent pain abdomen on POD 60 followed by 17 patients (17.9%) on POD 30.

Out of 55 patients with UGI pathologies, 26 patients (52%) had persistent pain abdomen on POD 60 with  $p=0.001$  which was statistically significant and 19 patients (34%) of the patient which UGI pathologies had persistent pain abdomen on POD 30 with  $p<0.001$  which was statistically significant.

Out of the 30 patients with *H. pylori* positive 16 patients (64%) had persistent pain abdomen on POD 60 and 13 patients (52%) had persistent pain abdomen on POD 30 with a  $p=0.001$  which was statistically significant.

## DISCUSSION

This prospective nonrandomized study was conducted in 100 selected patients with gall stones department of general surgery, Kempegowda institute of medical sciences, Bengaluru. The study was carried out in view to know the common UGI symptoms in gall stone patients and to study the role of preoperative UGI endoscopy as an investigative modality to rule out UGI pathologies.

The majority of patients presenting to general practitioners with chronic or colicky upper abdominal pain underwent USG examination. Ultrasound was non-invasive, readily available and inexpensive. After ultrasound detection of gallstones the main focus of the attending clinician stayed around treating the gallstones and further investigations to rule out other pathologies that may produce similar symptoms were seldom considered. Almost all of the patients with proven gallstones were referred to surgeons with a view to performing laparoscopic cholecystectomy. With the advancement in laparoscopic skills, laparoscopic cholecystectomy had become a very common and safe operation. As cholecystectomy became a safer and a more routine laparoscopic procedure. Patients consented to surgery without as much consideration as they had one in the past, when it was performed with a much more invasive open technique.

A proportion of patients experience similar pain after laparoscopic cholecystectomy. The cause of this pain may be peptic ulcer disease, hiatus hernia or other causes. These patients should first investigated to rule out gastroduodenal pathology before undergoing operation to remove gallstones.<sup>9</sup> This approach not only decreased persistence of symptoms but can also be helpful in detecting gastroduodenal pathologies at an early stage.

Among the 100 patients majority of the patients were in between 31-40 years of age which was about 32% followed by 51-60 years which was about 24% and 41-50 years which was about 23%. The majority of the patients were in age group between 30-60 years which constituted 79%. In a study conducted by Gaharwar et al the age group between 30-60 years accounted for 81.81%, age more than 60 years for 3.03% and age less than 30 years accounted to 15.16%.

Among these patients 61% were males and 39% were female. According, to a study by Cirillo et al the etiology has been attributed to the role of female sex hormones.<sup>11</sup> A study by Hulley et al had performed a research to equate the relation between estrogen receptors and cholesterol synthesis.<sup>12</sup> The study emphasized on the fact that estrogen stimulated the release of HMG Co-A reductase which simultaneously increase the synthesis of cholesterol leading to increased chances of supersaturation.<sup>12</sup> Similarly, progesterone hormone which inhibited the gall bladder contractility also contributed to the stone formation by causing bile stasis.<sup>12</sup>

In present study, pain in abdomen was present in 100% of patients. All the patients underwent USG abdomen and 54 patients (54%) had multiple gall stones, 38 patients (38%) had solitary gall stone.

UGI endoscopy was done routinely in all the cases in which 55 patients (55%) had UGI pathologies and 45 patients (45%) had normal endoscopic findings. The most common pathologies were GERD of about 27 patients (27%), antral gastritis of about 22 patients (22%), followed by antral erosions of about 11 patients (11%). 2 patients (2%) had gastric ulcer, 2 patients (2%) had duodenal ulcer and 1 patient (1%) had carcinoma esophagus. Out of the 55 patients with positive UGI endoscopic findings 30 (54.5%) patients had positive RUT and 25 (45.4%) patients had negative RUT. Out of total 55 patients with UGI pathologies on endoscopy 23 patients (41.8%) were <40 years age group out of which 10 patients (43.4%) had positive RUT. 32 patients (51.8%) with UGI pathologies are >40 years of age out of which 20 patients (62.5%) had positive RUT. This implies that *H. pylori* was most common cause of UGI pathologies in patients above 40 years with  $p=0.04$  which was statistically significant. Out of the total 100 patients, 95 patients underwent laparoscopic cholecystectomy, only 5 patients out of which 2 patients had gastric ulcer, 2 patients had duodenal ulcer and 1 patient had carcinoma esophagus laparoscopic cholecystectomy was abandoned.

The post-op events of pain abdomen were recorded on POD 7, 14, 30, 60 days and the results were tabulated accordingly. Out of the 95 patients who underwent cholecystectomy 3 patients (3.2%) had pain abdomen on POD 3, 7 patients (7.4%) had pain abdomen on POD 7, followed by 17 patients (17.9%) had persistent on POD 30, 35 patients (36.8%) had persistent pain abdomen on POD 60. Out of 55 patients with UGI pathologies 3 patients (5.45%) had pain abdomen on POD 7, 6 patients (10.9%) had persistent pain abdomen on POD 14, 17 patients (30.9%) had persistent pain abdomen on POD 30 with  $p<0.001$  which was statistically significant, 26 patients (47.2%) had persistent pain abdomen on POD 60 with  $p=0.001$  which was statistically significant. Out of the 30 patients with *H. pylori* positive and 3 patients (10%) had persistent pain abdomen on POD 7 and 14, 13 patients (43.3%) had persistent pain abdomen on POD 30 with a  $p=0.001$  which was statistically significant. 16 patients (53.3%) had persistent pain abdomen on POD 60 with  $p=0.001$  which was statistically significant.

Rassek et al recommended that investigation of the UGI must precede an elective cholecystectomy. His study showed that out of 960 patients for elective cholecystectomy, 589 underwent gastroscopy, although 56% had normal gastroscopy, 11.3% (113 patients) underwent a change in plan of therapy because of the OGD findings.<sup>13</sup> Diettrich et al also suggested preoperative endoscopy of the UGI tract in patients undergoing cholecystectomy to exclude other gastrointestinal disorders. His study suggested 31/100



patients had abnormalities on OGD resulting in changed plan of therapy.<sup>14</sup> Schenk et al suggested that because of the high incidence of simultaneous disease in the UGI tract, preoperative OGD should be performed before elective surgical therapy of symptomatic cholelithiasis. In his study, 1064/1143 (93.1%) patients underwent OGD and 30.2% (345 patients) had pathological findings. Of these, 68.3% were inflammatory in nature. 28 patients (2.5%) underwent additional GI surgical procedures along with cholecystectomy and bile duct exploration. 227 (19.8%) underwent pharmacological treatment of the GI disease after their biliary surgery.<sup>15</sup>

Sosada et al recommended routine pan endoscopy for each patient who qualifies to undergo laparoscopic cholecystectomy. He suggested that in asymptomatic cholelithiasis, pain was because of a peptic ulcer. Out of 2800 treated for cholelithiasis, OGD which was performed 1-4 days prior to surgery, showing pathological changes in the stomach or duodenum in 1187 (42%) patients, gastric ulcer in 179 (6.4%), duodenal ulcer in 127 (4.5%), gastritis in 375 (26.3%), polyps in 143 (5.1%) and cancer in 3 (0.1%) patients. The surgery was delayed for patients with ulcers and they were treated appropriately. 16 patients were asymptomatic after healing of the ulcer, thus they were proven to have asymptomatic cholelithiasis and a cholecystectomy was not performed.<sup>16</sup>

Hence due to higher incidence of other UGI abnormalities in patients with gall stone diseases can endoscopy before surgical management of gallstones can highly influence the treatment modalities.

## CONCLUSION

Cholelithiasis can present with complex combination of clinical symptoms which may resemble the presentation of other gastrointestinal disease. Our study confirms that certain symptoms associated with gallstones are not alleviated by cholecystectomy itself and requires further exploration including UGI endoscopy. Hence the use of routine preoperative investigations like UGI endoscopy prior to planning surgical treatment of cholelithiasis may help to identify other potentially treatable medical conditions and hence may reduce overall cholecystectomy rates.

Additionally, this will also help to treat the co-existing UGI pathologies alongside gall stone disease, therefore helping in reducing the incidence of post-cholecystectomy pain. Beside its cost effectiveness, it may potentially help in reducing the incidence of postoperative persistence of symptoms. UGI endoscopy has a vital role in the initial evaluation and investigation of patients with symptomatic gall stones.

Thus, it is recommended to perform routine UGI endoscopy prior to cholecystectomy as many

gastrointestinal lesions may coexist which prevents the complete relief of the symptoms.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

- Huang J, Chang CH, Wang JI, Kuo HK, Zin JW, Shan WY. Nationwide epidemiological study of several gallstone disease in Taiwan. *BMC Gastroenterol.* 2009;9:63.
- Singh V, Trikha B, Nain CK, Singh K, Bose SM. Epidemiology of gallstone disease in Chandigarh: a community-based study. *J Gastroenterol Hepatol.* 2001;16(5): 560-3.
- Kotwal MR, Rinchen CZ. Gallstone disease in the Himalayas (Sikkim and North Bengal): causation and stone analysis. *Indian J Gastroenterol.* 1998;17(3):87-9.
- Basselink MGM, Erpecum KJ. Biliary colic is a valuable clinical descriptor for biliary pain due to "uncomplicated" gallstone disease. *J Gastrointest Surg.* 2009;13(9):1745-6.
- Berger MY, Hartman TC, Vander VJMM, Bohnen A. Is biliary pain exclusively related to gall bladder stone? A controlled prospective study. *Br J Gen Pract.* 2004;54(505):574-9.
- Berger MY, Velden JJVD, Lijmer JG, deKort H, Prins A, Bohnen AM. Abdominal symptoms do they predict gallstones? A systematic review. *Scand J Gastroenterol.* 2000;35(1):70-6.
- Schirmer BD, Winters KL, Edlich RF. Cholelithiasis and cholecystitis. *J Long Term Eff Med Implants.* 2005;15(3):329-38.
- Murshid KR. The post cholecystectomy syndrome, a review. *Saudi J Gastroenterol.* 1996;2(3):124-37.
- Fahlke J, Ridwelski K, Manger T, Grote R, Lippert H. Diagnostic workup before laparoscopic cholecystectomy-which diagnostic tools should be used? *Hepatogastroenterology.* 2001;48(37):59-65.
- Gaharwar A. Factors favouring cholelithiasis in North Indian population. *IOSR J Pharma.* 2013;3(5):1-3.
- Cirillo DJ, Wallace RB, Rodabough RJ. Effect of estrogen therapy on gall bladder disease. *JAMA.* 2005;293:330-9.
- Hulley S, Grady D, Bush T. Randomized trial of estrogen plus progestin for secondary prevention of coronary heart disease in postmenopausal women. heart and estrogen/progestin replacement study (HERS). Research group. *JAMA.* 1998;280:605-13.
- Rassek D, Osswald J, Stock W. Routine gastroscopy before cholecystectomy. *Chirurg.* 1988;59(5):335-7.
- Dietrich H, Wundrich B, Kobe E, Noack S, Weber K. Gastroscopy before cholecystectomy. *Gastroenterol J.* 1990;50(4):173-4.

15. Schwenk W, Bohm B, Badke A, Zarras K, Stock W. Preoperative esophagogastroduodenoscopy before elective surgical therapy of symptomatic cholelithiasis. *Leber Magen Darm.* 1992;22(6):225-9.
16. Sosada K, Zurawinski W, Piecuch J, Stepien T, Makarska J. Gastroduodenoscopy: a routine

examination of 2,800 patients before laparoscopic cholecystectomy. *Surg Endosc.* 2005;19(8):1103-8.

**Cite this article as:** Kumar RS, Ram BM, Kumar CT, Reddy VK. Is endoscopy a must before laparoscopic cholecystectomy? *Int Surg J* 2021;8:2699-2706.