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Original Research Article

Abdominal symptoms and its outcome in gallbladder diseases following routine and emergency cholecystectomy

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ABSTRACT

Background: Gallstones constitute for the most common causes of biliary tract diseases in the adult population. The study thus aims to describe the persistence rate of abdominal symptoms in patients after elective cholecystectomy and to understand which symptoms, improve after cholecystectomy.
Methods: This observational study is based in Melmaruvatthur Medical College and Research Institute where 69 patients were a part of the study. A pre and post structured questionnaire was used to assess the decrease in the rate of symptoms. After fully informed and written consent the study participants were interviewed questioneired, examined according to the preformed and pretested proforma, patients with a clinical and ultrasonographic diagnosis of gallstones filled out a structured questionnaire on abdominal pain symptoms and functional gastrointestinal disorder before and at six months after cholecystectomy.
Results: From the observed chi square value of 9.315 and p value of 0.002 which is less than 0.01 so it is declared that there is an association between the cholecystectomy and symptoms in the post-surgical group.
Conclusions: The findings of the study thus suggest that while much of the findings lean toward ELC being better than DLC, the significance values show that no difference exist between the two. The study therefore states that more research is required to ascertain whether ELC or DLC is better at reducing the symptoms associated with gall bladder disease.

Keywords: Early and delayed cholecystectomy, Symptoms

INTRODUCTION

Gallstones constitute for the most common causes of biliary tract diseases in the adult population. It is said to mainly occur in Western countries. It is said that most of the gallstone diseases are asymptomatic however that their complications are usually life threatening.[1-5] Historically diseases of the gall bladder have been reported since 2000 BC when the bile duct was first described. Biliary colic which is a characteristic pain of the biliary system as a result of gallstones was first explained in the year 1661 by Thomas Bartholinuswho attributed for the colic to be arising when stones passed through the common bile duct (CBD).[6]

The symptoms of gallstones are most often non-specific and usually include biliary pain, abdominal pain, nausea and vomiting. Besides this, other symptoms such as heartburn, flatulence and belching have also been reported. Gallstone disease most commonly leads to complications such as acute cholecystitis, chronic cholecystitis and choledocholithiasis which can occur either with or without cholangitis. Gallstone pancreatitis and gallbladder carcinoma are however rare complications.[7]

Cholecystitis

The obstruction of the cystic duct by a gallstone leads to cholecystitis. This in turn leads to the distension of the gallbladder, as well as the inflammation and the oedema of the gallbladder wall. The wall of the gallbladder as a result becomes grossly thickened with the presence of dolor due to subserosal haemorrhages. In some cases, this process also progresses towards ischaemia and necrosis of the gallbladder wall. Clinically this process manifests itself as the biliary colic which becomes more severe and does not subside. The patient is febrile and also shows signs of anorexia with nausea and vomiting. A physical exam reveals focal tenderness in the upper right quadrant. In the case of chronic cholecystitis this pain is recurrent while Murphy's sign (inspiratory arrest with deep palpitations in the right subcostal area) is characteristic of acute cholecystitis.[7] The main stay aspects of management of cholecystitis remain cholecystectomy. Mainly, two types of cholecystectomy are carried out, namely, open cholecystectomy and laparoscopic cholecystectomy.

Symptomology and surgical intervention

A study by Jorgensen et al found that biliary colic was the strongest predictor for gallbladder disease in men with women describing the pain as 'strong and oppressive' after meals 100.

Common symptoms such as food intolerance, bloating, acid regurgitation, diarrhoea and constipation are common symptoms.[1,8-10] In the population making the choice for cholecystectomy hard. However some studies offer the view that these symptoms are not to be taken as an indication for surgery, even though the symptoms are vastly reduced post-surgery. Vetrhus et al in their randomized controlled trial evaluated cholecystectomy against watchful waiting.[11] It was observed from this study that more than half the patients who were in the watchful waiting group eventually underwent cholecystectomy. Despite this, the study concludes that watchful waiting is the better option. Another prospective study conducted over the span of 6 years states that young age and repeat episodes determine the future complications. This study concludes that in patients where the symptoms are less or absent it is better to conduct watchful waiting.[12]

Early versus delayed cholecystectomy

As per Skouras et al, their study evaluated the difference in the outcomes of delayed (DLC) versus early laparoscopic cholecystectomy (ELC) in patients that presented with a short history of cholecystitis.[13] While the study finds for no difference between the delayed and early procedures for conversion rates, the study states that early is largely better then delayed cholecystectomy. This has been ascertained in terms of length of stay as well as lowered morbidity and mortality rates. The study also states that while the time for surgery in ELC is longer than that of DLC, the incidence of developing serious complications such as injuries to the bile duct are lowered. Another study de Mestral et al evaluates the operative outcomes of early versus delayed cholecystectomy in acute cholecystitis.[14] The study is a retrospective cohort evaluating the impact of these procedures on very rare complications of bile duct injury and mortality. The study was conducted on a total of 22, 202 patients. The study findings depicted that early cholecystectomy was better than delayed. This was because ELC was associated with lowered rates of bile duct injury and mortality. The length of hospital stay was also reduced in the case of ELC. Interestingly, the study by Gurusamy et al reported that there was no difference in the outcomes for ELC and DLC when compared against each other.[15] However, they state that early cholecystectomy is overall safer. Several other studies too have reported the similar finding ELC being better than DLC.[16-19]

As is evidenced above, most of the studies depict that ELC is better DLC for outcomes such as mortality, morbidity, cost and length of stay. Some studies have even discussed the rare complications that may occur surgically or post operatively. Only two studies of these have reported no significant difference between ELC and DLC. It is interesting to note here that while all studies have reported morbidity and mortality in general, no study has reported evaluating just the abdominal symptoms as categorised for cholecystitis. Furthermore, few studies have been conducted in the Indian context in this regard. The present study is thus aimed at evaluating the difference in the abdominal symptoms between ELC and DLC. The abdominal symptoms have been classified as dyspepsia, vomiting, constipation and pain.

The objectives of this study were to describe the persistence rate of abdominal symptoms in patients after elective cholecystectomy; to identify predictors of symptom persistence and operative success. To understand which symptoms, improve after cholecystectomy; and to describe the important determinants of an unsuccessful operation.

METHODS

This study assesses the abdominal symptoms post early and delayed laparascopiccholecystectomy has been conducted in Mel Maruvathur Medical College and Research Institute. A total of 80 patients were identified and screened for the study. Of these, patients with other co-morbidities unrelated to gallbladder disease were excluded. Besides this, patients unwilling to give consent, complications, associated psychological factors, undergoing psychiatric management, on corticosteroids, above the age of 80 years, endoscopically proven GERD, peptic ulcer and oesophagitis, pancreatitis, appendicitis, diabetes mellitus, and patients unable to answer the questionnaire were excluded from the study. Patients who

were willing to give consent as well as those who had abdominal symptoms with cholecystitits that was confirmed with ultrasonography (USG) were included in the study. Thus, a total of 69 patients were included.

RESULTS

This study included 69 patients with abdominal pain who had completed a questionnaire detailing their demographic medical history and life style. Gall bladder disease was ascertained by the said clinical parameters and categorized as acute and chronic cholecystitis. All the analysis was carried out using SPSS 20.0 version. The results are presented in percentages. The chi-square test was used to compare the categorical/dichotomous variables among the groups. The p-value <0.05 was considered as significant.

Table 1: Demographical characteristics of patients.

Demographical characteristics	No. of patients	Percentage
Sex		
Male	11	15.9
Female	58	84.1
Total	**69**	100.0
Age group (years)		
11-20	4	5.8
21-40	25	36.2
41 to 60	34	49.3
> 61	6	8.7
Total	**69**	**100.0**
Parity		
Multi para	48	92.3
Primipara	1	1.9
Nullipara	1	1.9
ANC	2	3.8
Total	**52**	**100.0**
Obesity		
Mild	8	33.3
Moderate	7	29.2
Severe	9	37.5
Total	**24**	**100.0**

Table 2: Clinical signs of patients.

Abdominal symptoms	N (%)
Vomiting	42 (70.0)
Dyspepsia	21 (35.0)
Pain	2 (3.3)
Constipation	4 (6.7)

Majority 84 percent of the patients are female and 16 percent are male. When age is considered, majority of the patients belongs to 41-60 years followed by 36 percent are 21-40 years, 9 percent above 61 years and least 6 percent from 11-20 years. When parity is considered 92 percent of the patients are multi para followed by 4 percent are ANC and primipara and nullipara in 1.9 percent patients each. Majority of the patients with severe obesity followed by 33 per cent with mild and least 29 percent with moderate obesity (Table 1).

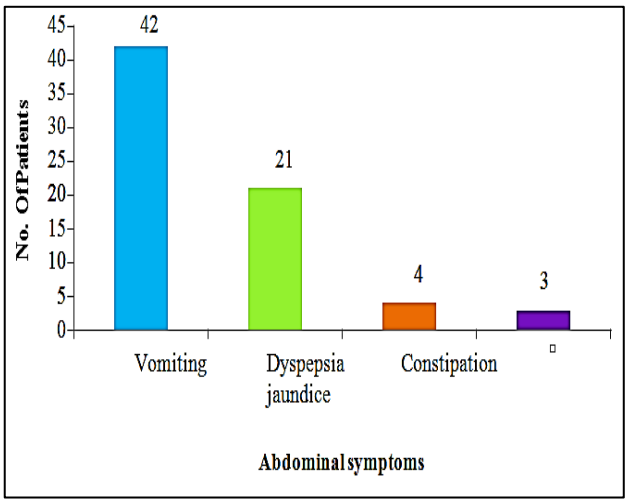

Figure 1: No. of patients with abdominal symptoms.

Table 2 presents the clinical signs of patients. Majority 70 percent of patients with abdominal symptoms vomiting followed by 35 percent with dyspepsia, 7 percent with constipation and 3 percent with pain (Figure 1). Majority 51 percent of the patients with emergency cholecystectomy, while 49 percent with routine cholecystectomy (Table 3 and Figure 2).

Table 3: Number of patients with routine and emergency cholecystectomy.

Cholecystectomy	No. of patients	Percentage
Routine cholecystectomy	34	49.3
Emergency cholecystectomy	35	50.7
Total	**69**	**100.0**

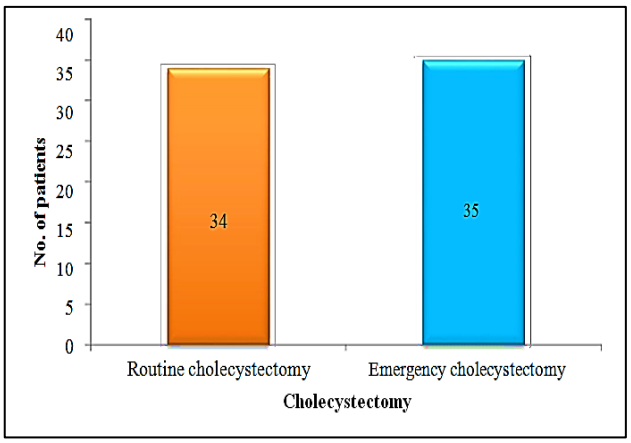

Figure 2: No. of patients with routine and emergency cholecystectomy.

Majority 32 percent of patients with small fibrosed with solitary stones followed by 23 percent of patients with distended thickened gallbladder with splenic access, 4.3 percent of patients with chronic fibrosed no stones and thickened no stones and thickened. No stones and least 2.9 percent are distended thickening of gallbladder, Distended thickened perforated gallbladder, no stones, distended thickened gallbladder with solitary stones, distended thickened gallbladder with stones and liver abscess, distended thickened with renal cyst, small fibrosed with renal cyst/stones, small fibrosed gallbladder with stones ovarian cyst, thickened gallbladder with stones and small fibrosed gallbladder. No stones each respectively. This in turn confirms the findings of the study (Table 4).

It is observed that 51% of the patients are required to do cholecystectomy immediately. Further in before group, the routine cholecystectomy in patients has the abdominal symptoms as vomiting (57.1%). While majority of the patients with emergency cholecystectomy does not have abdominal symptoms as vomiting (57.4%) in after group. From the observed chi square value of 9.315 and p value of 0.002 which is less than 0.01 so it is declared that there is an association between the cholecystectomy and vomiting in after group (Table 5).

Table 4: Ultra sound findings.

Ultra sound	Frequency (n)	Percent (%)
Chronic fibrosed- no stones	3	4.3
Distended thickened gallbladder	2	2.9
Distended perforated no stones	2	2.9
Distended thickened with solitary stones	2	2.9
Distended thickened with splenic access	16	23.2
Distended thickened with stones and liver access	2	2.9
Distended thickened with renal cyst	2	2.9
Distended thickened no stones	7	10.1
Small fibrosed with renal cyst/stones	2	2.9
Small fibrosed with solitary stones	22	31.9
Small fibrosed with stones and ovarian cyst	2	2.9
Thickened with stones	2	2.9
Thickened no stones	3	4.3
Small fibrosed - no stones	2	2.9
Total	**69**	**100.0**

Table 5: Association between cholecystectomy and vomiting.

	Cholecystectomy	Vomiting		Total	Chi-square
		Absent	**Present**		**(p-value)**
Before	Routine cholecystectomy	10 (37.0)	24 (57.1)	34 (49.3)	2.658
	Emergency cholecystectomy	17 (63.0)	18 (42.9)	35 (50.7)	(0.103)
	Total	**27 (100.0)**	**42 (100.0)**	**69 (100.0)**	
After	Routine cholecystectomy	26 (42.6)	8 (100.0)	34 (49.3)	9.315
	Emergency cholecystectomy	35 (57.4)	0 (0.0)	35 (50.7)	(0.002**)
	Total	**61 (100.0)**	**8 (100.0)**	**69 (100.0)**	

**p<0.01.

Table 6: Association between cholecystectomy and dyspepsia.

	Cholecystectomy	Dyspepsia		Total	Chi-square
		Absent	**Present**		**(p-value)**
Before	Routine cholecystectomy	23 (47.9)	11 (52.4)	34 (49.3)	0.116
	Emergency cholecystectomy	25 (52.1)	10 (47.6)	35 (50.7)	(0.773)
	Total	**48 (100.0)**	**21 (100.0)**	**69 (100.0)**	
After	Routine cholecystectomy	29 (45.3)	5 (100.0)	34 (49.3)	5.549
	Emergency cholecystectomy	35 (54.7)	0 (0.0)	35 (50.7)	(0.018*)
	Total	**64 (100.0)**	**5 (100.0)**	**69 (100.0)**	

*p<0.05.

It is observed that 51% of the patients are required to do cholecystectomy immediately. Further in before group, the routine cholecystectomy in patients has the abdominal symptoms as dyspepsia (52.4%). While majority of the patients with emergency cholecystectomy does not have abdominal symptoms as dyspepsia (54.7%) in after group. From the observed chi square value of 5.549 and p value of 0.018 which is less than 0.05 so it is declared that there is an association between the cholecystectomy and dyspepsia in after group (Table 6).

It is observed that 51% of the patients are required to do cholecystectomy immediately. Further in before and after group, the emergency cholecystectomy patient does not have the abdominal symptoms as pain (50.7%). From the observed chi square value of 0.000 and p value of 0.983 which is greater than 0.05 so it is declared that there is no association between the cholecystectomy and pain in before and after group (Table 7).

It is observed that 51% of the patients are required to do cholecystectomy immediately. Further in before group, the emergency cholecystectomy in patients does not have the abdominal symptoms as constipation (50.8%). While majority of the patients with emergency cholecystectomy does not have abdominal symptoms as constipation (51.5%) in after group. From the observed chi square value for before is 0.001 and after is 1.045 and p value of 0.976 and 0.307 which is greater than 0.05 so it is declared that there is no association between the cholecystectomy and constipation in before and after group (Table 8).

Table 7: Association between cholecystectomy and pain.

	Cholecystectomy	Pain		Total	Chi-square
		Absent	**Present**		**(p-value)**
Before	Routine cholecystectomy	33 (49.3)	1 (50.0)	34 (49.3)	0.000
	Emergency cholecystectomy	34 (50.7)	1 (50.0)	35 (50.7)	(0.983)
	Total	**67(100.0)**	**2 (100.0)**	**69 (100.0)**	
After	Routine cholecystectomy	29 (49.3)		34 (49.3)	5.549
	Emergency cholecystectomy	35 (50.7)		35 (50.7)	(0.018*)
	Total	**69 (100.0)**		**69 (100.0)**	

Table 8: Association between Cholecystectomy and constipation.

	Cholecystectomy	Constipation		Total	Chi-square
		Absent	**Present**		**(p-value)**
Before	Routine cholecystectomy	32 (49.2)	2 (50.0)	34 (49.3)	0.001
	Emergency cholecystectomy	33 (50.8)	2 (50.0)	35 (50.7)	(0.976)
	Total	**67(100.0)**	**4 (100.0)**	**69 (100.0)**	
After	Routine cholecystectomy	33 (48.5)	**1 (100.0)**	34 (49.3)	5.549
	Emergency cholecystectomy	35 (50.7)	0 (0.0)	35 (50.7)	(0.018*)
	Total	**68 (100.0)**	**1 (100.0)**	**69 (100.0)**	

DISCUSSION

The study confirms with some precision that the symptoms of the patients were reduced considerably in the 6 months follow-up post laparoscopic cholecystectomy. All the symptoms of cholecystitis including pain did show a substantial amount of cure rate. In line with some previous studies, it can be stated that factors such as selection of patient, wording of questions asked, and also the follow-up interval make it harder to compare the findings of this study.[20-25] The possible reasons that can be attributed to the reduction in the symptoms post-operatively are extensive evaluation and treatment following the surgery, patient who has undergone abdominal surgery increased the severity threshold for the pain and other symptoms they experience, the placebo effect of the patients feeling that the surgery was meant to solely decrease the symptoms they experienced pre-operatively. They also followed the belief that all the symptoms were caused by gallbladder disease. Patients also effected a change in dietary patterns following the surgery which may have led to fewer symptoms; the food related symptoms were also reduced as a result. A sampling error may have also caused the reporting of changes post-operatively as no short term symptoms were reported at all. Other factors attributed to the change may also be the perception towards the symptoms, such as what they perceived to be most bothersome was reported to persist as opposed to those symptoms that were not reported to be as bothersome. In this regard, the patient may have perceived for the pain to be bothersome due to a variety of reasons such as the

severity of the symptom, the inconvenience caused, duration as well as association of the symptoms to serious illness.

With each of the four symptoms a varied outcome has been noted with respect to whether early or delayed laparoscopic surgery was better. For the symptoms for dyspepsia and vomiting a significant difference was seen statistically with the reduction of the symptoms that were better in the cases of early cholecystectomy. For the symptoms of pain and constipation however, the symptomology was slightly better in the case of early cholecystectomy as compared to delayed cholecystectomy, but the difference was not of significant value. This bears the implication that for the cases of pain and constipation both early as well as delayed reported the same level of betterment of symptoms. However even with significant as well as slightly better outcomes noted in ELC, the study also finds for the fact that ELC is better than DLC which is consistent with other studies.[13,14,26] Conversely, considering that two symptoms showed significant difference while the other two did not show significant difference, it can be stated that there is not statistically significant difference between ELC and DLC. This too is consistent with some findings in the literature.[15,27]

The study is limited in the research design as well as the patient selection categories. There was also a lack of another group that did not undergo surgical intervention to assess the outcomes of symptoms. Additionally, it is quite challenging to study the abdominal symptoms as they vary in both duration as well as intensity. They also recur or occur unexpectedly, and can be caused by different pathophysiology. There is also the question of reliability of patient reporting the symptoms.[28,29] Further, the maintenance of a cordial physician and patient relationship may bias the patient's response to the outcomes of the surgery.

CONCLUSION

The main discrepancy that was found was between the differences of significance between the four symptoms. This can be suggestive of the fact that the criteria for operative intervention was not sufficiently rigorous or that the patient's expectations of symptom relief are rather unrealistic. The findings of the study thus suggest that while much of the findings lean toward ELC being better than DLC, the significance values show that no difference exist between the two. The study therefore states that more research is required to ascertain whether ELC or DLC is better at reducing the symptoms associated with gall bladder disease. Furthermore, the study also suggests that patient outcome can be better assessed if the patient population was those that were at a higher risk for poorer outcomes, patients with more severe symptoms as well as persistence of symptoms.

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