



A COMPARATIVE STUDY ON QUALITY OF LIFE IN PATIENTS WITH OPEN VERSUS LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Introduction- Laparoscopic cholecystectomy (LC) has been successful in replacing Open cholecystectomy (OC) as the procedure of choice for gallbladder disease with significant impact on quality of (QoL). **Material & Methods-** It is a prospective observational comparative study to assess QoL between OC (Group 1) and LC (Group 2) using Gastrointestinal Quality Life Index (GIQLI) questionnaire. Hundred patients were equally randomized into Group 1 and Group 2 using random number table and results were compared. **Results-** Preoperative demographic variables like age and gender distribution were comparable between the two groups. GIQLI score for OC and LC at postoperative week 1 was 71.32+3.83 and 82.8+5.94 respectively, p value- <0.001. At week 3, 77.42+3.73 and 103.58+10.81 respectively, p value- <0.001. At week 6, 112.38+14.74 and 124.76+10.14 respectively, p value- <0.001. **Conclusion-** Pre-operative QoL was comparable between OC and LC. While, at week 1, 3 and 6 post-operatively, a significantly lower QoL was observed in patients in OC as compared to LC.

KEYWORDS

INTRODUCTION

Cholecystectomy can be simply defined as the surgical technique of removal of gall bladder, and is one of the most prevalent surgeries in the world. People with cholelithiasis usually have inflammation of their gall bladder which is called as cholecystitis. The most certain symptomatic manifestation of gallstones is episodic upper abdominal pain. The pain is steady or colicky in intensity, may radiate to the upper back, be associated with nausea and lasts for hours to upto a day. Dyspeptic symptoms of indigestion, belching, bloating, abdominal discomfort, heartburn and fatty food intolerance are common in persons with gall stones, but are probably unrelated to the stones themselves and frequently persist after surgery. Gall stones are of three types – Pure cholesterol stones, Pigmented stones (brown or black) and mixed stones. The most common complications of gall stone disease are biliary colic, acute cholecystitis, acute pancreatitis, ascending cholangitis and gangrenous gallbladder. Less frequent complications include Mirizzi syndrome, cholecystocholedochal fistula and gall stone ileus. Laparoscopic cholecystectomy (LC) has been successful in replacing Open cholecystectomy (OC) as the procedure of choice for gallbladder disease.

Laparoscopic surgery has emerged as a faster, more-convenient and responsive method of surgery with lesser hospitalisation, less pain and better cosmetic appearance when compared to open surgery technique. It is the technique used during operative stages for surgery or surveillance of abdomen or pelvic region by making an incision of about 0.5-1.5cms at some distance from the target site. Thus, LC has been successful in replacing OC in the treatment of cholelithiasis, although, it is technically difficult in cases of gall bladder disease that have anatomical variations. As compared with OC, the incidence of bile duct injury appears to be increased in LC, resulting in significant morbidity, but the management of patients can be altered by LC. Bile leaks in LC range from 0.2%-2% and can result in formation of fistula formation and life-threatening biliary peritonitis.

LC is supposed to give substantial improvement in quality of life in patients especially, as it takes lesser time to recover, get back to daily routine, less post-operative pain and better aesthetic outcomes. Though it can be argued that overall quality of life (QoL) in patients undergoing laparoscopic surgery is improved as compared to ones undergoing OC, modern assessment scales like Gastrointestinal Life Quality Index (GILQI) allow assessment of QOL in different domains or daily functions and hence are able to report a more comprehensive and accurate.

MATERIAL AND METHODS

This was a prospective observational comparative study conducted in the department of General Surgery at a tertiary care hospital from February 2021 to July 2022 after the approval from the Institute Ethical Committee of the college. One hundred patients who presented to outpatient department with chronic cholecystitis with cholelithiasis,

aged more than eighteen years and willing to participate in the study were admitted and included for the purpose of study. Exclusion criteria included patients presenting with acute cholecystitis, empyema of gall bladder, refusal to consent for study and loss to follow up post surgery. These 100 patients were randomly divided into two groups 1 (OC) and group 2 (LC), 50 cases in each group (50 OC & 50 LC). Surgery was performed and patients were followed at week 1, 3, 6 in General Surgery OPD for post-operative assessment.

Assessment was done as per GIQLI questionnaire for their QoL. It contains thirty six questions each with five response categories. GIQLI score is calculated as the sum of total points. Most desirable option was given four points while least desirable option was marked zero. The data was collected and results were analyzed using SPSS (Statistical Package for Social Sciences) Version 21.0 statistical Analysis Software. The values were represented in number as percentages (%), mean, median along with their standard deviations. Student's paired "t" test was used to compare the change in a parameter at two different time intervals while chi square test was done to compare the categorical variables. Level of significance was denoted by a p-value < 0.05.

RESULTS

The present study was conducted with the aim to assess and compare QOL in patients undergoing open and LC. For this purpose, 100 patients who underwent elective cholecystectomy for chronic cholecystitis with cholelithiasis were divided randomly into two equal groups as shown in Table 1 with comparison of intergroup age distribution in Figure 1.

Table 1: Groupwise Distribution Of The Study Population

SN	Group	Surgery Type	No. of cases	Percentage (%)
1-	Group 1	Open Cholecystectomy	50	50.0
2-	Group 2	Laparoscopic Cholecystectomy	50	50.0
	Total		100	100.0

Demographic variables were also evaluated and compared in the two groups. The distribution of age in various age groups has been shown in Table 2 and Figure 1

Table 2: Intergroup Comparison Of Age

SN	Age Group (years)	Total		Group 1		Group 2	
		No.	%	No.	%	No.	%
1	18-20 yrs	2	2.0	2	4.0	0	0.0
2	21-30 yrs	20	20.0	7	14.0	13	26.0
3	31-40 yrs	31	31.0	16	32.0	15	30.0
4	41-50 yrs	27	27.0	13	26.0	14	28.0
5	51-60 yrs	16	16.0	10	20.0	6	12.0
6	≥61 yrs	4	4.0	2	4.0	2	4.0

$\chi^2=4.869$ (df=5); $p=0.432$						
	Mean	SD	Mean	SD	Mean	SD
	40.48	11.18	41.22	11.26	39.74	11.15
(Student's t-test) $t=0.660$; $p=0.511$						

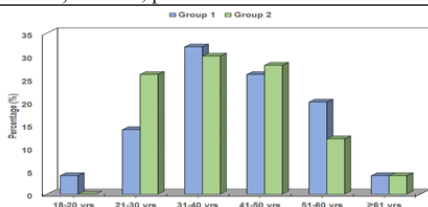


Figure 1: Intergroup comparison of Age

Age

Mean age in group 1 was 41.2 ± 11.26 years while in group 2, it was 39.74 ± 11.15 years. The difference was not statistically significant ($p=0.511$) and hence both the groups were comparable. Overall, a female preponderance (79.0%) was noted amongst the study population in general. There was a higher proportion of female patients in Group 1 as compared to Group 2 (82.0% vs. 76.0% respectively). Intergroup comparison of gender also showed that they were statistically comparable ($p=0.461$).

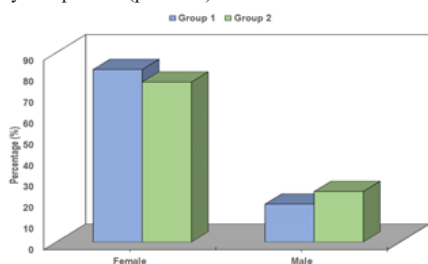


Figure 2: Intergroup Comparison Of Gender

Sex

QoL was assessed using the GIQLI questionnaire at different stages of treatment- pre-operatively, post-operatively week 1, week 3 and week 6 in the two groups as shown in Table 3.

Table 3: Comparison of GIQLI score at different time intervals

SN		Group 1		Group 2		Student's t-test	
		Mean	SD	Mean	SD	t	p
1	Pre-op	67.76	4.28	67.68	3.93	0.097	0.923
2	1 week Post-op	71.32	3.83	82.80	5.94	-11.492	<0.001
3	3 week Post-op	77.42	3.73	103.58	10.81	-161.80	<0.001
4	6 week Post-op	112.38	14.74	124.76	10.14	4.892	<0.001

Pre-operative comparability between the two groups was noted based on the scores of parameters in the questionnaire. A significant difference was noted in the scores of post operative week 1, week 3 and week 6 with group 2 showing better QoL as compared to group 1. The graphic representation of the same has been shown in figure 3.

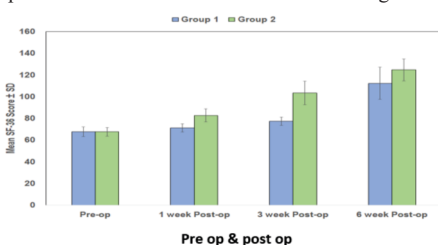


Figure 3: Comparison of GIQLI score at different time intervals

DISCUSSION

LC has replaced open surgery in the treatment of various gallbladder diseases requiring cholecystectomy. Now-a-days LC is the standard procedure for the treatment of symptomatic gall bladder stones. However, few patients require conversion to OC. Patients might sometimes be at a higher risk of experiencing a difficult procedure or

conversion. The patient experience and satisfaction is not only limited upto the ease or length of procedure and hospital stay but is also affected by their post-operative experience in terms of re-emergence of symptom manifestation in post-operative period that have an impact on quality of life of patients. One of the externality post-surgery is the high prevalence post-cholecystectomy syndrome, especially during the early post-operative period and is one of the major reasons affecting the patient experience, satisfaction and quality of life in general.

It is also of key importance to note that the choice between laparoscopic or open surgery is dependent on the surgeons' experience, availability of tools & technology, urgency of surgery and symptoms of anatomical changes in the gall-bladder. Nonetheless, alike most of the surgeries, the end-point of the surgical procedure is to restore daily activity levels and disease free survival, at such it is important to assess the QOL in patients undergoing cholecystectomy post-operatively to formulate better management strategies and also help in choice of the surgery.

Moreover, assessing the post-operative QOL, helps in developing new techniques to tackle the dynamically changing environment and help in giving momentum to development of new instruments to counter them. Moreover, it also helps to understand how the selection of the surgery type could play a role in determining the post-operative experience and satisfaction of patients.

Hence, the present study was conducted to assess and QOL among patients undergoing cholecystectomy and to compare QOL between OC vs. LC.

For this purpose, a comparative study was conducted, including 100 patients (mean age: 40.48 ± 11.18 years; 79% Females) and were randomized into two groups, Group 1 undergoing OC and Group 2 undergoing LC. Age and Gender were comparable between the two groups (Group 1: 41.22 ± 11.26 years, 82% females; Group 2: 39.74 ± 11.15 years, 76.0% females). Though, most of the contemporary literature reports a similar trend for age, Ahmad et al. (2015)²¹ and Bashir et al. (2015)²² reported mean age of 48.3 ± 6.55 years and 47.43 ± 6.62 years in their study populations respectively, which were higher than the present study, but Atif et al. (2022)²³ reported mean age of 41.56 ± 10.13 years, which was very similar to the present study. In another study conducted by Lin et al. (2010)²⁴ in China, mean age of the patients was 49.8 ± 13.7 years. Similarly, most of the contemporary studies also report a similar trend of female preponderance among patients undergoing cholecystectomy, Matovic et al. (2012)²⁵ reported 58.0% of the overall population were females. Similarly, Lin et al. (2010)²⁴ reported 67.68% of the population were females. Atif et al. (2022)²³ also reported a higher proportion of women (55.71%) in their study conducted in Pakistan. Most of the prevalence studies have already established occurrence of cholelithiasis and cholecystitis are more common in women population as compared to men".

Moreover, the difference in age among populations in various studies can be attributed to the availability of healthcare resources and factors like urgency for surgery etc. Also, it is important to note that the present study was conducted during the consecutive lockdowns after COVID-19 outbreak, and during the time most of the working people were working from home or office visits were limited, as such many of the patients who did not need an urgent surgery, opted for one to avoid absenteeism and loss of working days.

In the present study, to report the baseline QOL among patients undergoing cholecystectomy, GIQLI assessed pre-operatively and compared between the two groups (GIQLI: Group1: 67.76 ± 4.28 ; Group 2: 67.68 ± 3.93 $p>0.005$). However, both these assessment tools were comparable between the two groups. These findings were higher than the findings of study conducted by Matovic et al. (2012)²⁵ who reported a pre-operatively GIQLI was comparable between the LC and OC group (LC: 42.22 ± 9.19 ; OC: 34.47 ± 8.73). Though, in another study by Atif et al. (2022)²³ pre-operative assessment of GIQLI was reported 96.64 ± 2.24 , which is much higher to the present study.

Irrespective of exact values, the research methodology for comparative studies suggests that the groups should be comparable at baseline for all factors that might cause bias and to avoid any selection bias in the present study, randomization was done, which allowed for

equal probability for each patient to be treated by either of the surgeries and hence, QOL at baseline was comparable between the groups. Also, as GIQLI was created in the west and is considered a Global tool, some difference in the score is often seen due to geographical and regional differences and life style of the sub-populations.

Similar to the present study, Chen et al. (2005)²⁶ evaluated GIQLI score at pre-operative and 2, 5, 10 and 16 weeks post-operatively and compared the score between patients undergoing laparoscopic and OC, also they evaluated the change in GIQLI score at different post-operative interval. The study highlighted that GIQLI was comparable between the treatment groups at pre-operatively, while for all post-operative intervals GIQLI scores showed improvement with time-duration, i.e. GIQLI scores improved at each follow-up.

In the present study, GIQLI scores pre-operatively, were comparable between the treatment groups. At 1, 3 and 6-week post-operative interval GIQLI scores were lower in patients in Group 1 as compared to Group 2 (Week 1: 71.32±3.83 vs. 82.80±5.94; Week 3: 77.42±3.73 vs. 103.58±10.81; Week 6: 112.38±14.74 vs. 124.76±10.14).

Most of the contemporary studies reported a similar finding, Atif et al. (2022)²³ reported a mean GIQLI in LC was 106.09±2.40 at 6-weeks post-operatively and a mean change of 11.44±3.29. Another study by Wanjura et al. (2014)²⁷ reported a mean GIQLI of 115.2±19.7 post-operatively. Sandblom et al. (2009) also reported a significant improvement in GIQLI score in all components of GIQLI and overall GIQLI at 6 months post-operatively.

The findings in present study are interesting and pioneering to some extent. Till date no study has evaluated post-cholecystectomy quality of life using GIQLI compared the scores of the QOL assessment between different modes of surgery. The present study tried to do so and showed post-cholecystectomy quality of life which is mainly governed by symptomatic relief and is hence is significantly improved as compared to pre-operative QOL, moreover it was also reported that the QOL among patients undergoing laparoscopic surgery is better as compared to patients undergoing open surgery.

In fact, while improvement in quality of life of patients is one of the ultimate objectives of LC and a substantial improvement in quality of life has been encountered in a number of studies, however, there are limited studies on evaluating the determinants of change in QOL. Further exploratory studies to find out such determinants are recommend.

CONCLUSION

The present study was conducted to compare the QOL of patients undergoing open versus LC. Following inferences were drawn from the study: Firstly, QoL assessed by GIQLI pre-operatively was comparable between the groups. At week 1, 3 and 6 post-operative interval, a significantly lower GIQLI score was observed in patients in OC as compared to LC.

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