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Determinants of Quality of Life after Laparoscopic Cholecystectomy

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ABSTRACT

Background: Laparoscopic Cholecystectomy is one of the most common surgical procedures. Quality of life (QOL) is a concept reflecting physical, social, and emotional attitudes. Surgical operation, as a traumatic treatment procedure, could affect QOL of the patients as well as treating them. Therefore, surgeons should try their best to improve patient's QOL in addition to focus on the more traditional outcomes of mortality, morbidity, and laboratory findings.

Objectives: The aims of the current work were to determine risk factors for calcular cholecystitis and assess the determinants of quality of life after laparoscopic cholecystectomy.

Patients and methods: This cross-sectional study included a total of 200 patients prepared for laparoscopic cholecystectomy, attending at Department of Surgery, Menoufia University Hospital, Egypt. Patients were first introduced and consented for the study at the surgery outpatients' clinics during the preoperative settings and guided to fill out the chosen questionnaires and filling out other important information. Patients' understanding and readiness to fill out the questionnaire without help were assessed. Assistance was offered accordingly.

Results: The demographic of the studied population shows predominant female distribution which was about three times their fellow Males. Mean age was 43 years. Presence of comorbidity in 41.5% of patients. There was a statistically significant difference between the preoperative scores and 3 months postoperative in all domains as the total score of Gastrointestinal Quality of Life index (GIQLI) improved by about ten points.

Conclusion: It could be concluded that with no doubt laparoscopic cholecystectomy positively affected the Quality of life. Patients subjectively had significant improvement of their symptoms. Some social determinants can predict postoperative outcomes.

Keywords: Laparoscopic Cholecystectomy, Quality of Life.

INTRODUCTION

The gallbladder stones and cholecystitis prevalence are highly variable through the world with different distribution among several ethnicities. In general Gallstones are common in the adult affecting more than 10 to 15% of the adult population **(1).**

In the Middle East gallstones and subsequent cholecystectomy is one of the most common operation performed in general surgical units. It represents up to 57% of major elective surgery and about 43% of emergency surgery this percentage is even higher in developed countries **(2).**

Although most gallstones are usually clinically silent, 20% of people having stones experience true biliary symptoms at some time; 1% to 2% of patients each year could experience complications and require surgical removal of the gallbladder. Yet the number of operations for cholelithiasis has increased since 1950 in developed countries. Since the frequency of gallbladder surgeries was six times higher in the United States than in Western Europe. Gallstone disease in Europe, however, is similar to that in the United States, with a median prevalence in large population surveys ranging from 5.9% to 21.9% **(3)**.

The reason for this disparity could possible not lie in the prevalence of cholelithiasis prese, but most likely represent differences in surgical practice. Ever since the introduction of laparoscopic cholecystectomy in 1989 further increased the cholecystectomy rate in the United States and the United Kingdom, there was a 28% increase in the numbers of cholecystectomies performed in the late nineties **(3).**

The possible explanation for this increase is that laparoscopy is less invasive, providing a lower surgical risk and better patient acceptance compared with conventional (open) surgery, therefore leading to more surgeries in patients previously thought too high a risk or in those with minimal symptoms. Although there is undoubtedly an element of overuse, cholecystectomy is now the most common elective abdominal surgery performed in the United States, with more than 750,000 operations annually **(3).**

The rate of cholecystectomy has notably increased in Egypt, probably owing to increased awareness and improved governmental health services. Given the Unique medical problems in Egypt the decision to either proceed with surgical intervention or not is particularly important for Egyptians, where gallstones may be associated with liver fibrosis, cirrhosis, and/or viral hepatitis, rendering cholecystectomy hazardous owing to vascular adhesions taking into consideration the impact on their quality of life knowing that majority of Egyptian are suffering from compromised quality of life to begin with **(4).**

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PATIENTS AND METHODS

This cross-sectional study included a total of 200 patients prepared for laparoscopic cholecystectomy, attending at Department of Surgery, Menoufia University Hospital, Egypt.

Patients were first introduced to the study and consented for the study at the surgery outpatients' clinics during the preoperative settings and guided to fill out the chosen questionnaires and filling out other important information. Patients' understanding and readiness to fill out the questionnaire without help were assessed. Assistance was offered accordingly. Contact information were collected as well to remind patients before the follow up visits. Those information and other identifying data were kept in a safe locker to ensure patients confidentiality.

Patients were instructed about the importance of the follow up visits' timing, making sure that meets the patients' convenience. The follow up visits were held after 1 month and 3 months intervals following the date of the planned surgery. A reminder phone call within 48 hours of the scheduled follow up visits, which were held at the same outpatient clinic.

Study participants:

All patients within the time frame, who were confirmed by an Ultrasound to have calcular cholecystitis and prepared for laparoscopic cholecystectomy were offered to join the study. Among 266 patients screened to join the study, 66 were excluded. 23 of them had refused to join the study, 10 did not met the inclusion criteria, and 33 patients failed to attend any of the follow up visits.

Exclusion criteria:

Those who refuse to participate, patients having malignancy, patient with severe physical illness, patients with severe psychiatric illness, patients with coagulopathy, and patients having contraindications for anesthesia.

Ethical consideration:

The study was approved by the ethical committee of the Faculty of Medicine at Menoufia University. An informed written consent was taken from each participant after a simple and clear explanation about the research objectives and potential benefit. The consent form was developed according to the recommendation of the standard in Quality and Improvement System in the Ministry of Health in Egypt, which was introduced in all family health centers and units. All collected data were kept confidential and used for the research purpose only.

Study tools:

All patients were introduced to two parts questionnaire first was El-Gilany Questionnaire followed by gastrointestinal Quality of Life Index ((GIQLI)) Questionnaire as following:

A) Socioeconomic data was collected Using the most Updated and validated socioeconomic status scale in Egypt by EL-Gilany. The new socioeconomic status scale has 7 domains with a total score of 84 **[(5)].**

B) Gastrointestinal Quality of Life Index Questionnaire (GIQLI) **[(6)],** a valid and reliable Questionnaire. It is consistent of 36 questions under four main domains, namely, gastrointestinal symptoms (19 questions), physical items (7 questions), psychological items (5 questions) and social items (5 questions). Each question response is ranked from (all the time, most of the time, little of the time and never). Each answer is rated from 0 to 4, while 0 is all the time answer and 4 for never answer, since highest scores means better quality of life.

Beside the data that were collected by the questionnaire. Detailed history and physical examinations (general and local examination) were done to ensure patients eligibility for the study. Additional information was collected, such as history of present illness with its onset and duration any associated GIT symptoms. Past history of presence of co- morbid conditions, previous operation, blood transfusion and hospitalization. Patients were subjected to detailed general and local examination which included (weight, height, BMI, vital signs and abdominal examination). Revision of patients Investigation of abdominal ultrasound to confirm diagnosis also some lab correlation when needed (blood picture, serum bilirubin, CPR and ESR). Operative data which include: (operative time, presence of operative complication, conversion rate, etc.

Each patient was offered the questionnaire preoperatively, after 1 month of surgery and again after 3 months of surgery.

Statistical analysis

Statistical presentation and analysis of the present study were conducted with SPSS V.23 (using an IBM personal computer). Mean value and Standard Deviation [SD]: for quantitative data. Frequency and percentage for the qualitative data. Chi-square test: for comparison of two independent qualitative normally distributed variables. Student t-test: for comparison of two independent quantitative normally distributed variables. P-value > 0.05 was considered statistically non-significant. P-value < 0.05 was considered statistically significant. P-value < 0.001 was considered statistically highly significant.

RESULT

Table (1): Descriptive characteristics of the studied population (Total = 200).

	No	%
Sex:		
Male	47	23.5%
Female	153	76.5%
Age (years)	**(mean ± SD)** (43.05 ± 8.7)	
Presence of comorbid condition:	83	.5%
Type of comorbid conditions:		
Diabetes mellitus	38	19%
Myocardial infarction, heart failure	16	8%
Chronic kidney disease	15	7.5%
COPD, Asthma	14	14%
Weight (kg)	**(mean ± SD)** (77.45 ± 6.4)	
Height (cm)	**(mean ± SD)** (163.45 ± 6.9)	
BMI ((kg/m2))	**(mean ± SD)** (29 ± 3.4)	

Table (1): The demographic of the studied population shows predominant female distribution which was about three times their fellow Males. Mean age of 43 years. Presence of comorbidity in 41.5% of patients. Mean BMI is about 29%.

Table (2): Differences between preoperative and 1 month postoperative regarding gastrointestinal quality of life index.

	Preoperative (mean ± SD)	1-month postoperative (mean ± SD)	Paired T Test	P-value
Gastrointestinal symptoms (19 items, range 0-76)	**(57.14 ± 8.7)**	**(60.32 ± 12.06)**	**9.93**	**.000**
Physical conditions (7 items, range 0-28)	**(18.34 ± 4.07)**	**(20.39 ± 3.88)**	**3.64**	**.000**
Emotional status (5 items, range 0-20)	**(13.5 ± 2.82)**	**(15.11± 2.56)**	**5.24**	**.000**
Social function (5 items, range 0-20)	**(13.15 ± 3.07)**	**(16.48 ± 2.55)**	**6.92**	**.000**
Total score (rang 0-144)	**(102.13 ± 12.3)**	**(112.42 ± 16.511)**	**15.64**	**.000**

In table (2) demonstrate the statistically significant difference between the preoperative scores and 1 month postoperative in all domains as the total score of GIQLI improved by about ten points.

Table (3): Differences between preoperative and 3-month postoperative regarding gastrointestinal quality of life index.

	Preoperative (mean ± SD)	3-month postoperative (mean ± SD)	Paired T Test	P-value
Gastrointestinal symptoms (19 items, range 0-76)	**(60.32 ± 12.06)**	**(60.27 ± 12.35)**	**9.93**	**.045**
Physical conditions (7 items, range 0-28)	**(20.39 ± 3.88)**	**(20.93 ± 4.1)**	**6.7**	**.000**
Emotional status (5 items, range 0-20)	**(15.11± 2.56)**	**(15.4 ± 2.71)**	**8.58**	**.000**
Social function (5 items, range 0-20)	**(16.48 ± 2.55)**	**(16.22 ± 2.95)**	**13.34**	**.000**
Total score (rang 0-144)	**(112.42 ± 16.511)**	**(112.83 ± 18.7)**	**9.4**	**.000**

In table (3) demonstrate the statistically significant difference between the preoperative scores and 3 months postoperative in all domains as the total score of GIQLI improved by about ten points.

Table (4): The influence of different sex on GIQLI preoperatively.

	Males (47 patients) (mean ± SD)	Female (153 patents) (mean ± SD)	T Test	P-value
Gastrointestinal symptoms (19 items, range 0-76)	(55.6 ± 9.3)	(57.6 ± 8.4)	1.41	.158
Physical conditions (7 items, range 0-28)	(18.14 ± 4)	(18.4 ± 4)	.37	.707
Emotional status (5 items, range 0-20)	(12.8 ± 3.03)	(13.7 ± 2.7)	1.9	.055
Social function (5 items, range 0-20)	(12.8 ± 2.8)	(13.2 ± 3.1)	.515	.416
Total score (rang 0-144)	(99.36 ± 13.2)	(102.99 ±11.9)	1.77	.078

Table (4) investigates the effect of the sex on the preoperative GIQLI scores and as shown not statistic significant difference is detected.

Table (5): The influence of different sex on GIQLI outcome after 1 month postoperatively.

	Males (47 patients) (mean ± SD)	Female (153 patents) (mean ± SD)	T Test	P-value
Gastrointestinal symptoms (19 items, range 0-76)	(50.5 ± 10.7)	(63.3 ± 10.8)	7.05	.000
Physical conditions (7 items, range 0-28)	(18.4 ± 3.2)	(20.9 ± 3.9)	3.94	.000
Emotional status (5 items, range 0-20)	(13.5± 2.6)	(15.6 ± 2.3)	4.821	.000
Social function (5 items, range 0-20)	(16.14± 2.48)	(16.58 ± 2.57)	1.017	.301
Total score (rang 0-144)	(99 ± 15.04)	(166.45 ±14.7)	7.01	.000

In Table (5) the influence of different sex is detected as males (which were less than third of the cases) showed less favorable outcome after 1 month postoperatively. Except for the social function, which was similar between the two groups

Table (6): The influence of the Age on GIQLI 3 months postoperatively.

	atients' more than 60 years old (14 patients) (mean ± SD)	tients' less than 60 ars (186 patients) (mean ± SD)	T Test	P-value
Gastrointestinal symptoms (19 items, range 0-76)	.8 ± 12.5)	.05 ± 12)	3.35	.001
Physical conditions (7 items, range 0-28)	(17.5 ± 4.2)	(21.2 ± 4.02)	3.29	.001
Emotional status (5 items, range 0-20)	(12.8 ± 3.7)	(15.6 ± 2.5)	3.8	.013
Social function (5 items, range 0-20)	(13.5 ± 3.8)	(16.4 ± 2.8)	3.6	.014
Total score (rang 0-144)	(93.65 ± 20.45)	(144.2 ± 17.8)	4.136	.002

Table (6) shows the statistically significant difference between patients with different age groups (older and younger than 60 years old) regarding GIQLI scores after 3 months postoperatively.

Table (7): The influence of very low socioeconomic level compared to other socioeconomic level on GIQLI 3 months postoperatively.

	Very low Socioeconomic level (mean ± SD)	Other socioeconomic levels (mean ± SD)	T Test	P-value
Gastrointestinal symptoms (19 items, range 0-76)	**(48.5 ± 7)**	**(60.6 ± 12.3)**	**4.04**	**.007**
Physical conditions (7 items, range 0-28)	**(17.3 ± 3.1)**	**(21.04 ± 4.1)**	**2.18**	**.030**
Emotional status (5 items, range 0-20)	**(12.8 ± 2.3)**	**(15.5 ± 2.7)**	**2.4**	**.015**
Social function (5 items, range 0-20)	**(12.7 ± 2.9)**	**(16.32 ± 2.9)**	**3.05**	**.003**
Total score (rang 0-144)	**(91.3 ± 12.3)**	**(133.5 ± 18.5)**	**2.9**	**.004**

Table (7) there statistically significant difference between patients in very low SES category and other SES levels after three months postoperatively.

DISCUSSION

Based on the demographic distribution of the studied population the mean age was (43.05) years, which is consistent with **Kariuki *et al.*** [7], who stated that there is increase of gall bladder diseases in the fifth decade of life. That could explain the exponential increase the prevalence of gallbladder stones by 4 to 10 times after the fifth decade of life.

According To **Figueiredo *et al.*** [8] after about 10.7 years of follow-up of 13,437discovered patients of gallbladder diseases, they found the average age at diagnosis was 73.5 (range = 45.3–94.8) years. Which is much older to our studied poplation. That could be explained by the difference in life expectancy and population pyramids between the United States and Egypt.

The current study, we observed a female predominance of 76.5% compared to 23.5% males. This results were much similar to **Belman *et al.*** [9], that had female to male ratio about 3:1. Although **Figueiredo *et al.*** [8] reported higher incidence in women, but they stated lower percentage than this current study revealed. Since they included (57.9%) women and (42.1%) men. Against the traditional perception there are increasing percentage of male suffering from cholelithiasis, and they usually have more severe symptoms compared to females [10].

The current study, we discovered mean body mass index (BMI) of 29%, which lean toward overweight population, who are to have more prevalence of gall bladder diseases, moreover according to **Chauhan *et al.*** [10], there is a negative correlation between BMI and grade of severity of gallbladder symptoms, which accompanied by negative consequence during after the surgical treatment.

Cha and Kim [11] study suggests that combined Obesity and hypertension history are highly associated with gall bladder stones, this conclusion was stated after controlling for age and sex by matching patients and controls regarding these risk factors and using multivariate logistic regression.

The current study, the presence of diabetes as is ranked on the top of the researched comorbidity, since 19% of our population were previously diagnosed DM, according to **Chen *et al.*** [12] there is a strong association between DM and gallstone diseases. This goes along with the fact that gall bladder disease is more prevalent with all components of metabolic syndrome.

The current result goes along with **Bielderman *et al.*** [13] conclusions, since they acknowledge the longitudinal relationship between the SES and quality of life in general. This study revealed the psychological and the physical impact of the lower SES which could hinder the expected improved of the surgery.

Current study illustrates the differences between GIQLI preoperatively and one month postoperative**,** which shows predominant improvement in all domains of the index 1 month and three months postoperative with statistic significant differences. Since the mean total score of the GIQLI is about (102) preoperatively which increase to a mean of about (112) 1 month postoperatively. Patients are showing more improvement in 3 months postoperatively with statistic significant differences when compared to the preoperative questionnaire. That results comply to may studies that advocate for the laparoscopic cholecystectomy as the gold standard treatment of calculary cholecystectomy, although the current result is similar to **Yu *et al.*** [6] in the significant improvement postoperatively compared to the preoperative results, but what is worth mentioning is that in Yu *et al.*, they

described about 4 points higher in preoperative GIQLI compared to the current study, and even 8 points more in the one month postoperative. We can read this as a proof of the steady increase of the postoperative outcome in patients with higher preoperative to begin with.

Although the male component of the population is less than one fourth of the total patient's number, they still suffer from a low score of the GIQLI through the postoperative period compared to their fellow female patients, although there was no statistically significant difference between both groups in the preoperative scores. Based on **Coelho *et al.* [(14)]** male gender is associated with higher incidence of open conversion rate and more complication in general.

The current result goes along with **Bielderman *et al.* [(15)]** conclusions, since they acknowledge the longitudinal relationship between the SES and quality of life in general. This study revealed the psychological and the physical impact of the lower SES which could hinder the expected improved of the surgery.

The influence of age was greatly appreciated in the current study, especially when taking in consideration that the gall bladder stones diseases are more prevalent in middle age groups. Older age groups are in more risk of unfavorable outcomes. According to the preoperative scores of patients who are older and younger than 60 years old are quite similar, however when monitored in the postoperative scores in the current study, there was a statistically significant difference between the patients older than 60 years and patients who are younger. That's best explained by the effect of age on healing and coping after surgeries in general. **Irojah *et al.* [(16)]** couldn't identify increase in morbidity and mortality in older age patients, according to them, his statement wasn't particularly true in emergency surgery verses elective ones. **Matsui *et al.* [(17)]** investigated the effect of age on the biliary tract surgeries, they concluded a rapid increase of the number of older populations who needed surgery in advanced counties with higher incidences of complications.

CONCLUSION

It could be concluded that with no doubt laparoscopic cholecystectomy positively affected the Quality of life. Patients subjectively had significant improvement of their symptoms. Some social determinants can predict postoperative outcomes.

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