Quality-of-life after cholecystectomy in Kazakhstan and Sweden: comparative study based on the GIQLI questionnaire

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Research

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Abstract

Background: As severe morbidity rarely is the focus in gallstone surgery, health-related quality of life has evolved as the main outcome measure of the management of patients with gallstone disease. The lack of universally accepted guidelines on treatment of gallstone disease has also resulted in great regional differences in the preoperative evaluation and management of patients with gallstone disease.

Objective: The aim of this study was to compare quality-of-life following gallstone surgery in cohorts from Kazakhstan and Sweden.

Methods: A comparative study on quality-of-life (QoL) after cholecystectomy (CE) in two cohorts from Sweden and Kazakhstan using the Gastrointestinal Quality-of-Life Index (GIQLI) questionnaire. QoL measures of 259 patients in Kazakhstan and 448 patients in Sweden were compared taking into account surgical approach, mode of admission, and indication for surgery. Patients in both cohorts were requested to fill in the GIQLI questionnaire after surgery. Similar routines were applied to ensure high coverage in both countries.

Results: The mean overall GIQLI score was higher for patients undergoing cholecystectomy in Sweden than those in Kazakhstan ($p<0.01$). The same was seen when stratifying for open or laparoscopic surgery (both $p<0.05$), absence of presence of acute cholecystitis (both $p<0.05$) and emergency admission ($p<0.05$), but not in case of planned admission ($p=0.54$).

Conclusions: There were large differences in perceived QoL, even when taking indication for surgery and approach into account. These differences in may be explained by differences in attitudes to health status and treatment expectations. Standardized routines for evaluating the outcome after surgery are needed.

Introduction

Gallstone disease (GSD) is one of the most common conditions managed by surgery in the world. In Western countries the prevalence is approximately 7.9% for men and 16.6% for women. In Asian countries it ranges from 3% to 15%. The incidence of gallstone increases with age, reaching a cumulative incidence of 45-50% in women over 80 years-of-age[1,2]. The only definitive treatment for GSD and the "gold standard" for managing GSD-related morbidity is cholecystectomy. In some cases, GSD may develop into serious conditions such as biliary pancreatitis, obstructive jaundice, cholangitis, or acute cholecystitis. In most cases, however, elective cholecystectomy is undertaken with the sole aim of reducing painful attacks[3]. As morbidity and mortality are not major issues in such cases, postoperative quality-of-life remains the most important outcome when assessing potential benefits from cholecystectomy in patients with GSD. Moreover, it is often impossible to determine which gastrointestinal symptoms are related to GSD, which makes it difficult to select patients for cholecystectomy. Since there are few studies comparing “watchful waiting” with surgery and a lack of generally accepted guidelines for selecting those patients with GSD who should be recommended cholecystectomy, great differences in local and regional routines in the preoperative evaluation of these patients exist. This could lead to situations where healthcare system resources and cultural perceptions of the condition have greater impact on management than objective preoperative findings and valid predictions of postoperative outcome.

Numerous factors affect the quality of life of patients after surgery, e.g. preoperative evaluation of diagnosis and symptoms, surgical approach, mode of admission, age and gender of the patient[4]. Furthermore, local traditions with

regard to health issues and cultural habits, and personality have a great impact on how symptoms and outcome after surgery are perceived and expressed.

The aim of the present study was to compare quality-of-life using the GIQLI questionnaire following surgery for GSD in population-based cohorts from Sweden and Kazakhstan, and to explore the factors that may have influenced how the participants rated their quality of life.

Methods

The Kazakhstan cohort (Cohort1)

A total of 650 patients who underwent cholecystectomy between 2013 and 2015 in Kazakhstan were identified. Inclusion criteria were complete citizen data (passport data, residential address and contact information), age over 18 years, diagnosis of acute or chronic cholecystitis and history of LCE and MCE. Exclusion criteria were incomplete citizen data or age under 18 years.

The patient survey was conducted 2016 - 2017. The telephone directory was used to obtain the phone numbers of all 650 patients. Each patient was rung up and asked to consent to participate in the survey after a detailed explanation of the goals and importance of the survey, and also their address of residence. A questionnaire, a cover letter, and a stamped addressed envelope were sent by post. Some patients agreed to be interviewed by telephone.

Of the 650 invited participants, 259 (39.8%) replied. Of these, 88 (34%) answered by post and 171(66%) by phone. The time interval between surgery and the survey ranged from 0.7 to 4.1 years. There were 183 (70.7%) women and 76 (29.3%) men. Mean age was 51.7 years, standard deviation 13.3 years. Most patients (128, 49.3%) were between 41 years and 60 years (Table 1).

There were 145 (56%) laparoscopic and 114 (44%) mini-laparatomy cholecystectomies. Histopathological examination showed chronic calculous cholecystitis (CCC) in 44 (17.0%) cases and acute calculous cholecystitis (ACC) in 215 (83.0%) cases. Procedures were undertaken after emergency admission in 176 (68.0%) cases, and planned admission in 83 (32.0%) cases.

TheSwedish cohort (Cohort II)

The cohort was extracted from the local database in Mora, Sweden. It included 448 patients who had undergone CE between February 1, 2002 and December 26, 2004, and who were 20 years-of-age and older. All patients were asked to answer a questionnaire sent by mail. The survey of patients was conducted between February 21, 2007 and December 14, 2008.

Of the 448 patients who underwent CE, 325 (72.5%) were women and 123 (27.5%) men. The age of the responders ranged from 21 years to 76 years. Mean age was 51.8 years (standard deviation 13.3 yrs). Patients were divided into two groups according to diagnosis: chronic cholecystitis or pain attacks 307 (68.5%); and acute cholecystitis 141 (31.5%). Altogether 368 (82.1%) patients underwent planned surgery, 78 (17.4%) patients were admitted as an emergency, and 2 (0.4%) patients were not specified. Altogether 388 (86.6%) underwent LCE.

The GIQLI questionnaire

Patients in Cohort 1 were requested to answer the GIQLI questionnaire in 2016. According to the recommendations of the MAPI Research Trust (Lyon, France)[5] we validated this questionnaire for the first time in Kazakhstan and

received official permission to use it. The GIQLI questionnaire is a recognised and valid tool for evaluating QL in patients with various gastrointestinal diseases and is widely used for evaluating QL in patients with gallstone disease.

The GIQLI questionnaire consists of 36 items (each scored 0 – 4) covering the following domains: severity of gastrointestinal symptoms – Symptom (19 questions); emotional component - Emotion (5 questions); physical function - physical Function (7 questions); social function - Social Function (4 questions); and response to treatment - Medical Treatment (1 question). The total GIQLI score assessment is performed by calculating the sum of all points for all items. The domains are analysed by summing the scores in a similar manner. A comparison was made regarding the general characteristics of the two cohorts (Table 2) [6].

In Cohort II, patients with chronic cholecystitis and/or pain attacks predominated. The proportion of planned patients and laparoscopic operations was slightly higher than in Cohort I. Since there were differences between the two groups for several of the parameters, comparison of QoL indicators was carried out for the cohort as a whole and then stratified surgical approach, mode of admission, and nature of gallbladder inflammation.

Statisticalanalysis

Statistical processing of the results was performed using SPSS Statistics 20.0 (IBM). For each quantitative indicator, the mean value (M), standard deviation (SD), and 95% confidence interval (CI) were calculated. The normality of the distribution was evaluated using the Kolmogorov-Smirnov test, and statistical calculations were performed using variance analysis (ANOVA) and the nonparametric Wilcoxon-Mann-Whitney test (WMW). A p-value <0.05 was considered statistically significant.

Results

GIQLIscoreaftercholecystectomy

The total GIQLI score was 4.9% higher in Cohort I than in Cohort II (p = 0.001). Cohort I scored higher in the domains "Symptoms" (5.9%) and "Physical Functioning" (0.6%, both p<0.001).

Scores by gallbladder histopathology

In the subgroup of patients who had undergone surgery for acute cholecystitis, the total GIQLI score was 1.9% higher in Cohort 1 (p<0.001). The same was seen for the domains "Symptoms" (2.4%) and "physical Function" (8.0%). In the chronic cholecystitis and/or pain attacks subgroup, the GIQLI scores in Cohort I were significantly higher than those in Cohort II for all domains. The greatest differences were observed in the total QIQLI score (5.4%) and the domains “Symptoms” (6.3%) and “Physical Function” (3.9%, p = 0.001).

Scores by surgical approach

In the LCE patients, differences in QoL domains between the 2 Cohorts were slightly greater, with Cohort I patients scoring higher Thus, significant differences were observed in total GIQLI score (6.3%) and in the "Physical Function" domain (0.9%) (p<0.001).

Scores by mode of admission

For patients who underwent planned admission, the total GIQLI score was 3.8% higher in Cohort 1 ($p<0.001$). The same was seen for all domains except "Social Function" and "Medical Treatment". In the case of emergency hospitalisation, the Cohort II patients were 1.8% higher for the domain "Social Function" ($p=0.01$) and 4.7% higher for "Medical Treatment" ($p = 0.04$).

Discussion

In this comparison of GIQLI scores of patients after cholecystectomy in Sweden and Kazakhstan, patients with similar characteristics such as age, gender, diagnosis, surgical access, and type of hospitalisation were extracted from databases in the two countries to form two cohorts. The cohorts were similar with regard to 3 parameters - diagnosis, surgical access, and type of hospitalisation, on which this comparative study was based.

Not taking into account confounding factors, the total GIQLI score in Cohort I was higher than Cohort II, as well as the domains "Symptoms" and "Physical Function". When taking into account confounders such as mode of admission, surgical approach and histopathology of the gallbladder, similar results were obtained in a comparative analysis.

The question is: do these results and diverging outcomes reflect the level of medical care in the countries compared, or are they the result of cultural differences in how patients assess their health? Healthcare expectations differ between countries and healthcare systems, and is to a great extent dependent on the autonomy of the patient and the role the patient plays in the choice of treatment. This is a problem that has been observed in a previous study from Sweden[7]. There are differences between Kazakhstan and Sweden regarding indication for surgery, in particular the proportion of patients operated for acute cholecystitis. However, it is unlikely that preoperative diagnosis should have a persisting impact on QoL as long as the procedure *per se* does not cause persisting symptoms. As there were only slight differences in surgical approach used between the two countries, other factors probably had a greater influence on postoperative QoL. Gastrointestinal symptoms of diseases other than GSD may have already been present preoperatively, and could have caused problems affecting QoL postoperatively, especially if the patient has not been mentally prepared for the expected outcome prior to the procedure.

Various instruments have been used to assess outcome after gallstone surgery. In the present study, we used the Gastrointestinal Quality of Life Index (GIQLI)[6] questionnaire. GIQLI has been used for different conditions causing symptoms in the gastrointestinal tract. This questionnaire was developed in 1993 and published in both German and English, and has subsequently been validated in Sweden[8], China[9], Spain[10], France[11] and now Kazakhstan.GIQLI has been shown to have good external validity and not to be culturally or linguistically dependent.

Most previous studies on QoL after GSD surgery have concerned surgical approach[12-16], patient-related factors[4,7], or timing of the procedure[17-19]. Studies on the impact of cultural differences on QoL of patients with pathologies other than GSD have been performed[20-23]. In general these studies indicate that the healthcare system and disease perception may have an impact on self-reported outcome, even if surgical management and treatments are similar. The present study confirms these observations.

Although the present study indicates differences in self-reported quality-of-life between the two countries, there were no major differences regarding indication for surgery or surgical approach. This suggests that there may be cultural differences or factors related to the healthcare systems that must be taken into account when comparing self-reported outcomes between countries. The present study was unable to discern whether there were diverging ethnic or environmental factors that had an impact on the clinical manifestations of GSD, but there are no substantial

differences in surgical management of the disease between Sweden and Kazakhstan. Nevertheless, the present study suggests that there may be circumstances related to healthcare systems, cultural norms and expectations that result in differences in self-reported outcome following gallstone surgery. Further studies are required to see how such factors affect patient experience of outcome after gallstone surgery so that these may also be taken into account in the clinical decision-making process and not just firm guidelines and uniform outcome criteria.

Conclusions

There were large differences between Kazakhstan and Sweden in perceived QoL, even when taking indication for surgery and approach into account. These differences in may be explained by differences in attitudes to health status and treatment expectations. Standardized routines for assessing indications for surgery preoperatively and systematic follow-up of patient-perceived outcome may be a way of increasing focus on QoL when assessing the quality of care for patients with gallstone disease.

Declarations

Ethical approval: The study was approved by the Ethical Review Board of the Karaganda State Medical University, Kazakhstan (#239, 2016-02-09) and the Ethical Review Board of Uppsala, Sweden (#2006/244).

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Tables

Table 1: Age distribution

Number 1of patients	Years									
	20-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64	Older 64
Completely	5	13	14	23	34	34	26	34	22	54
%	1,9	5,0	5,4	8,9	13,1	13,1	10,0	13,1	8,5	20,8

Table 2: Cohorts from Kazakhstan and Sweden

Patient characteristics		Kazakhstan Sweden		k	c^2	p
		Cohort I	Cohort II			
Age (years)	20-25	5 (1.9%)	8 (1.8%)	9	9.9	0.36
	26-30	13 (5.0%)	23 (5.1%)			
	31-35	14 (5.4%)	26 (5.8%)			
	36-40	23 (8.8%)	47 (10.5%)			
	41-45	34 (13.1%)	40 (8.9%)			
	46-50	34 (13.1%)	45 (10.0%)			
	51-55	26 (10.0%)	73 (16.3%)			
	56-60	34 (13.1%)	66 (14.7%)			
	61-64	22 (8.5%)	35 (7.8%)			
	>64	54 (20.8%)	85 (19.0%)			
Gender	Male	76 (29.3)	123 (27.5%)	1	0.289	0.325
	Female	183 (70.7%)	325 (72.5%)			
Diagnosis	Acute cholecystitis	215 (83.0%)	141 (31.5%)	1	**174.4**	**<0.001**
	Chronic cholecystitis/ pain attacks	44 (17.0%)	307 (68.5%)			
Surgical approach	Cholecystectomy via mini-laparotomy	114 (44%)	60 (13.4%)	1	**82.9**	**<0.001**
	Laparoscopic cholecystectomy	145 (56%)	388 (86.6%)			
Admission	Planned	83 (32%)	369 (82.4%)	1	**180.2**	**<0.001**
	Emergency	176 (68%)	79 (17.6%)			
Total		259 (100%)	448 (100%)			

Table 3: Analysis of quality-of-life indicators in the GIQLI questionnaire for patients who have undergone cholecystectomy in Kazakhstan (cohort I) and Sweden (cohort II)

Domain	Cohort	N	M	SD	95% CI		Min	Max	F	p
					lower boundary	Upper boundary				
Symptoms	I	259	64.01	11.10	62.65	65.37	24	76	18.70	**<0.001**
	II	448	60.39	10.53	59.41	61.36	21	76		
Emotion	I	259	16.05	3.79	15.58	16.51	1	20	0.12	0.73
	II	448	16.15	3.49	15.82	16.47	3	20		
Physical Function	I	259	23.05	5.98	22.32	23.79	0	28	26.21	**<0.001**
	II	448	20.83	5.30	20.34	21.32	1	28		
Social Function	I	259	14.09	2.49	13.79	14.40	5	16	0.16	0.69
	II	448	14.18	2.83	13.91	14.44	0	16		
Medical Treatment	I	259	3.68	0.70	3.60	3.77	0	4	0.92	0.34
	II	448	3.73	0.67	3.67	3.80	0	4		
Total GIQLI score	I	259	120.89	22.40	118.15	123.63	44	144	12.08	**<0.001**
	II	448	115.27	19.65	113.45	117.10	30	144		

Table 4: GIQLI scores after surgery for acute and chronic cholecystitis in Kazakhstan (cohort I) and Sweden (Cohort II)

Domain	Cohort	**Acute cholecystitis**				**Chronic cholecystitis**			
		N	M(SD)	p		N	M(SD)	p	
				ANOVA	WMW			ANOVA	WMW
Symptoms	I	215	62.85 (11.56)	0.22	**0.04**	44	69.70(5.86)	**<0.001**	**<0.001**
	II	141	61.35 (10.58)			307	59.94 (10.49)		
Emotion	I	215	15.76 (4.00)	0.10	0.20	44	17.45 (2.10)	**0.01**	**0.03**
	II	141	16.43 (3.25)			307	16.02(3.60)		
Physical Function	I	215	22.49 (6.27)	**0.01**	**<0.001**	44	25.82 (3.08)	**<0.001**	**<0.001**
	II	141	20.82 (5.14)			307	20.84(5.38)		
Social Function	I	215	13.82 (2.62)	0.66	0.10	44	15.41 (0.95)	**0.01**	**0.05**
	II	141	13.96 (3.01)			307	14.28(2.74)		
Medical Treatment	I	215	3.62 (0.76)	0.27	0.24	44	3.98 (0.15)	**0.02**	**0.02**
	II	141	3.71(0.67)			307	3.75 (0.67)		
Total GIQLI score	I	215	118.54 (23.46)	0.34	**0.02**	44	132.36 (10.35)	**<0.001**	**<0.001**
	II	141	116.26 (19.54)			307	114.82(19.71)		

Table 5: GIQLI scores by surgical approach in Kazakhstan (cohort I) and Sweden (Cohort II)

Domain	Cohort	**Mini-laparotomic cholecystectomy**				**Laparoscopic cholecystectomy**			
		N	M (SD)	p		N	M (SD)	p	
				ANOVA	WMW			ANOVA	WMW
Symptoms	I	114	62.54 (12.05)	0.34	0.22	145	65.17 (10.18)	**<0.001**	**<0.001**
	II	60	60.70 (11.65)			388	60.34 (10.36)		
Emotion	I	114	15.73 (3.94)	0.60	0.40	145	16.30 (3.67)	0.69	0.33
	II	60	16.05 (3.76)			388	16.16 (3.45)		
Physical Function	I	114	22.63 (6.13)	**<0.001**	**<0.001**	145	23.39 (5.86)	**<0.001**	**<0.001**
	II	60	19.25 (5.99)			388	21.08 (5.15)		
Social Function	I	114	13.78 (2.56)	0.24	0.60	145	14.34 (2.41)	0.95	0.16
	II	60	13.23 (3.41)			388	14.32 (2.70)		
Medical Treatment	I	114	3.65 (0.73)	0.76	0.83	145	3.71 (0.69)	0.63	0.54
	II	60	3.68 (0.68)			388	3.74 (0.67)		
Overall GIQLI	I	114	118.32 (23.50)	0.14	**0.05**	145	122.90 (21.35)	**<0.001**	**<0.001**
	II	60	112.92(22.35)			388	115.64(19.20)		

ANOVA-variance analysis. WMW-nonparametric Wilcoxon-Mann-Whitney test

Table 6: GIQLI scores according to nature of hospitalization in Kazakhstan (cohort I) and Sweden (Cohort II)

Domain	Cohort	**Planned admission**				**Emergency admission**			
		N	M (SD)	p		N	M (SD)	p	
				ANOVA	WMW			ANOVA	WMW
Symptoms	I	83	69.10 (6.78)	**<0.001**	**<0.001**	176	61.61 (11.92)	1.00	0.75
	II	368	60.12 (10.51)			78	61.62 (10.61)		
Emotion	I	83	17.30 (2.40)	**<0.001**	**0.01**	176	15.45 (4.17)	0.12	0.18
	II	368	16.11 (3.51)			78	16.29 (3.45)		
Physical Function	I	83	25.42 (3.80)	**<0.001**	**<0.001**	176	21.94 (6.49)	0.20	**0.01**
	II	368	20.83 (5.32)			78	20.86 (5.22)		
Social Function	I	83	15.02 (1.62)	**0.01**	**0.09**	176	13.65 (2.70)	**0.03**	**0.01**
	II	368	14.12 (2.91)			78	14.42 (2.41)		
Medical Treatment	I	83	3.87 (0.46)	**0.07**	**0.05**	176	3.60 (0.78)	**0.08**	**0.04**
	II	368	3.73 (0.68)			78	3.77 (0.62)		
Total GIQLI score	I	83	130.71 (13.57)	**<0.001**	**<0.001**	176	116.26 (24.21)	0.82	0.54
	II	368	114.91(19.66)			78	116.96(19.60)		

ANOVA-variance analysis. WMW-nonparametric Wilcoxon-Mann-Whitney test