

Post-Operative Anticipation of Outcome after Cholecystectomy

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ABSTRACT

Background: A substantial group of patients with gallstone disease experience negative outcome after surgical removal of the gallbladder (cholecystectomy). Early identification of these patients is important.

Purpose: The purpose of the study was to recognize predictors (trait anxiety and clinical symptoms) of negative symptomatic outcomes at 5 weeks after cholecystectomy.

Materials and Methods: Consecutive patients (n = 66), 18–60 years, with symptomatic gallstone disease, completed symptom checklists and the state-trait anxiety inventory preoperatively and at 6 weeks after cholecystectomy. **Results:** High trait anxiety was the only predictor of persistence of biliary symptoms at 6 weeks after cholecystectomy (OR = 6.79). **Conclusion:** In addition to clinical symptoms, high trait anxiety is a predictor of negative symptomatic outcome at 6 weeks after cholecystectomy. Trait anxiety should be evaluated to aim at a patient-tailored approach in gallstone disease.

Keywords: Cholecystectomy, Symptomatic gallstone disease, Trait anxiety.

INTRODUCTION

Whereas it is true that no operation has been more profoundly affected by the advent of laparoscopy than cholecystectomy has, it is equally true that no procedure has been more instrumental in ushering in the laparoscopic age than laparoscopic cholecystectomy has. Laparoscopic cholecystectomy has rapidly become the procedure of choice for routine gallbladder removal and is currently the most commonly performed major abdominal procedure in Western countries^[1].

A National Institutes of Health consensus statement in 1992 stated that laparoscopic cholecystectomy provides a safe and effective treatment for most patients with symptomatic gallstones and has become the treatment of choice for many patients^[2].

This procedure has more or less ended attempts at non-invasive management of gallstones. Surgical removal of the gallbladder (cholecystectomy) is the regular procedure in case of symptomatic gallstone disease. Positive results are stated after cholecystectomy, for example, relief of biliary pain (74–96%), a decrease of lower abdominal pain (66–91%), and less dyspepsia (46–89%)^[3, 4]. In contrast, a substantial group of patients report unacceptable outcomes after cholecystectomy, for example, the persistence and improvement of new symptoms and pain^[5-8]. Early recognition of these patients is critical to improve clinical decision making.

Deprived post-cholecystectomy result is allied with clinical factors, for example, heightened pain sensitivity, high comorbidity, a long history of complaints (biliary pain, symptoms, attacks), the use of psychotropic medication, and preoperative dyspeptic symptoms^[9-13]. Stable personality behaviours, such as neuroticism and introversion^[14, 15]; similarly have a negative influence on long and short-term results, for example, medication use and pain. Trait anxiety is a dimensional feature of personality connected to neuroticism^[16]. Trait anxiety is defined as a relatively stable individual variance in the tendency to respond with intensified anxiety to threatening situations^[17].

The influence of trait anxiety on post-cholecystectomy recovery is inarticulate^[18, 19], as studies examined small populations^[14, 18] and focussed on the first 5 days after cholecystectomy only. Evidence of the influence of trait anxiety on post-cholecystectomy result is flawed as studies used different procedures and result variables, and controlled for different pre-operative and postoperative factors. We assumed that high trait anxiety is a risk factor of negative post-cholecystectomy result, next to clinical risk factors. Clinical experience teaches that the majority of patients report a relief of symptoms and return to work at 6 weeks after discharge^[20]. Consequently, we investigated the impact of high trait anxiety on a symptomatic outcome at 6 weeks after discharge.

MATERIALS AND METHODS

The present study was performed at the Department of Surgery in **King Abdulaziz Hospital**. Consecutive patients (18–60 years) with diagnosed symptomatic gallstone disease, awaiting an elective laparoscopic cholecystectomy, were eligible for the study. Exclusion criteria are: history of abdominal malignancy, undergoing an emergency procedure or intended open cholecystectomy, choledocholithiasis, cholangitis, known pregnancy, suffering from severe or life-threatening systemic diseases, known liver cirrhosis, previous upper abdominal surgery (precluding laparoscopic method), and psychiatric diseases. All patients were subjected to a standard surgical and anaesthetic procedure. Medical records were checked for medical history and somatic comorbidities. Before admission and 6 weeks after cholecystectomy, patients completed and returned a set of self-report questionnaires.

The study was done according to the ethical board of Umm Al Qura University.

The demographic questionnaire that was completed preoperatively, asked about gender and age. Preoperatively and at six weeks after cholecystectomy, patients completed a symptom checklist. Patients were asked to specify whether they were bothered by one or more symptoms associated to gallstone disease in the past week. Categorisation into biliary, dyspeptic, and non-specific symptoms was based on the study of **Weinert *et al.***^[7]. After surgery, surgical reports were checked for the occurrence of gallstones/sludge and conversion for a laparoscopic procedure to open cholecystectomy. At 6 weeks postoperatively, medical reports were checked for the number and moment of surgical consultations after cholecystectomy, visits to the emergency room, and admissions to the hospital with regard to the cholecystectomy. Patients completed the 20-item trait scale of the state-trait anxiety inventory preoperatively. Trait anxiety reflects the extent of anxiety that patients normally feel and rests stable over time and amid pre-operative and postoperative conditions. The trait anxiety measure of the state-trait anxiety inventory has good test–retest reliability and internal consistency. Patients with a score above the 80th percentile cut-off score were specified as patients with high trait anxiety^[21, 22]. The size of the subgroup provided sufficient statistical power.

Chi-square and Student's *t* tests were utilized to explore contrasts between taking part patients and patients who rejected or finished

participation sooner than 6 weeks (dropouts) and differences between patients with and without high trait anxiety. Changes in the report of classes of symptoms over time were computed utilizing McNemar tests. Persistence of symptoms was characterized as patients detailing at least one symptom within a particular category both before and after cholecystectomy. Emergence was defined as patients not reporting one or more symptoms within a specific category before cholecystectomy, but reporting symptoms within this category at 6 weeks. Persistence and emergence rates were calculated using frequencies. Predictors of the persistence and emergence of symptoms were calculated by multivariate logistic regression, inserting gender, age, the report of preoperative biliary, dyspeptic and non-specific symptoms, and high trait anxiety.

RESULTS

In total, 119 patients were found eligible for this study. 3 patients were not contacted before cholecystectomy, 12 patients were treated expectantly, and 7 patients refused to participate. Preoperatively, 97 patients received the first questionnaire, which was not returned by 14 patients. In the course of 6 weeks, six patients ended the participation. At 6 weeks postoperatively, patients received a second questionnaire, which 12 patients did not return. Only patients who returned both questionnaires were included (*n* = 68). Due to missing data, statistical analyses were performed on 66 patients. Clinical and demographic characteristics are shown in Table 1. All included patients had experienced biliary or dyspeptic symptoms before surgical consultation. Gallstones or sludge were demonstrated in 90% and 9% of the patients, respectively. In three patients, laparoscopic cholecystectomy was converted to an open procedure. No differences were found between participating patients and patients who did not return their questionnaires or ended participation within 6 weeks. Preoperatively, 12.5% of the male patients and 24% of the female patients had high trait anxiety. Patients with high trait anxiety did not differ from other patients on clinical and demographic characteristics and time frame before completion of the postoperative questionnaire. Preoperatively, the report of biliary, dyspeptic, and non-specific symptoms was the same for patients with and without high trait anxiety ((*n* = 13) and (*n* = 47), respectively).

Table 1: Baseline characteristics

Demographic characteristics	N	%
Male patients (%)	16	24.2%
Age (M ± SD)	46.9 ± 12.4	
Preoperative biliary symptoms (%)	48	72.5%
Upper abdominal pain (%)	44	66.4%
Nausea (%)	26	39.4%
Vomiting (%)	11	16.6%
Preoperative dyspeptic symptoms (%)	43	65.2%
Bad taste (%)	17	25.8%
Heartburn (%)	17	26.5%
Lower abdominal pain (%)	15	22.8%
Diarrhoea (%)	10	14.4%
Flatulence (%)	24	35.8%
Preoperative non-specific symptoms (%)	36	54.5%
General malaise (%)	7	10.6%
Fatigue (%)	31	47.0%
Weight change (%)	2	3.0%
Decreased sexual functioning (%)	5	7.6%
Other health complaints (%)	9	13.6%
Time between cholecystectomy and surgical consultation (M ± SD, days)	38.34 ± 24.44	

At 6 weeks, patients with high trait anxiety more often experienced biliary and non-specific symptoms than patients without high trait anxiety ((53% versus 14%, $\chi^2 = 15.39$, $p < 0.001$) and (80% versus 35%, $\chi^2 = 14.48$, $p < 0.001$), respectively). In the course of 6 weeks after cholecystectomy, the report of biliary and dyspeptic symptoms did not change in patients with high trait anxiety. In contrast, the percentages of patients without high trait anxiety experiencing biliary and dyspeptic symptoms reduced from 73% to 15% ($\chi^2 = 46.68$, $p < 0.001$) and from 65% to 47% ($\chi^2 = 9.09$, $p = 0.002$), respectively. In both groups of patients, the report of non-specific symptoms did not change. Compared with other patients, patients with high trait anxiety more often reported the persistence and emergence of biliary symptoms postoperatively ((19% versus 58%, $\chi^2 = 10.67$, $p = 0.001$) and (4.0% versus 43%, $\chi^2 = 4.38$, $p =$

0.023), respectively). The persistence and emergence of dyspeptic symptoms and persistence of non-specific symptoms were equally reported in patients with and without high trait anxiety. Though, at 6 weeks post-cholecystectomy, patients with high trait anxiety reported the emergence of new non-specific symptoms more often (95% versus 49%; $\chi^2 = 10.9$, $p = 0.001$).

Prediction of postoperative symptoms

Multivariate logistic regression analyses showed that high trait anxiety was the only predictor of persisting biliary symptoms at 6 weeks after cholecystectomy (Table 2). Preoperative biliary symptoms and high trait anxiety both predicted the persistence of non-specific symptoms. No predictors could be identified for the persistence of dyspeptic symptoms or the emergence of new symptoms at 6 weeks post-cholecystectomy.

Table 2: Predictors of symptomatic outcomes at 6 weeks post-cholecystectomy

Symptomatic outcome	Preoperative predictor	OR	95% CI	p
Persistent biliary symptoms	High trait anxiety	6.79	1.76–26.47	0.005
Persistent non-specific symptoms	Biliary symptoms	5.1	1.01–26.39	0.048
	High trait anxiety	4.69	4.45–487.46	0.003

DISCUSSION

Even though cholecystectomy is the treatment of choice in symptomatic gallstone disease, various patients report continuing symptoms. The main concern is to recognize patients with an intensified risk of negative outcomes. Preoperative symptoms have been considered carefully, and dyspeptic symptoms are found to be risk factors for long-term outcomes after cholecystectomy (>6 months) [7, 13]. This prospective follow-up study delivers suggestion that personality, in this case high trait anxiety (>80th percentile score on the trait scale of the state-trait anxiety inventory), has an influence on post-cholecystectomy recovery after controlling for preoperative symptom report. Actually, high trait anxiety is the only predictor of persistent biliary symptoms after cholecystectomy, whereas preoperative symptoms are not. The odds that patients with high trait anxiety stated persistent biliary symptoms were 6.79 times the odds perceived for patients without high trait anxiety. Previous examinations on the effect of personality on results after cholecystectomy prompted uncertain proof. Preoperative neuroticism was an indicator of short-term results, for example, torment, disposition, and the utilization of narcotics <7 days after cholecystectomy [23], yet was not related with continuing agony at 1 year [24]. Moreover, introversion expects pain at 1 year after cholecystectomy [13]. Findings from the present examination proposed that attribute uneasiness might be an indicator of long-term results after cholecystectomy. Past investigations on attribute uneasiness did not give solid help to an effect on post-cholecystectomy results [14, 18]. These investigations created conflicting discoveries, depended on little populaces, and focussed on post-cholecystectomy results (<5 days post-operatively). Patients with high scores on quality nervousness have higher pain sensitivity [25] and experience the ill effects of gastro-intestinal conditions frequently [26]. Moreover, high characteristic tension may prompt an attentional predisposition on real sensations and side effects [27]. As diagnosing symptomatic gallstone sickness is unpredictable and patients with gastro-intestinal side effects are wrongly shown for cholecystectomy, patients with high characteristic nervousness might be in danger for poor basic leadership. Negative symptomatic results might be the outcome. This study has a prospective follow-up design, which allows us to follow the course of symptoms through time. Presence of consecutive patients

visiting the outpatient clinic in the study disallowed a selection bias and reduced the effect of confounding variables at 6 weeks postoperatively. Participants, non-participants and dropouts did not vary on demographic and clinical characteristics. Additionally, participants and dropouts did not vary on the report of symptoms and high trait anxiety. Nevertheless, as information on the report of preoperative symptoms and high trait anxiety were not collected, a bias cannot be precluded. We utilized a self-constructed symptom checklist, based on literature, clinical experience, and information from focus groups. Additionally, as the number of patients above the 80th percentile score is quite small, some outcomes of this study might not reach significance as a result of the limited sample size. Six weeks after discharge is chosen as moment of follow-up, as patients experience greatest symptomatic development within this period [20]. Even though this time point is appropriate for a first inventory of post-cholecystectomy results, additional research is desirable to establish a relationship between high trait anxiety and long-term post-cholecystectomy results.

CONCLUSION

Trait anxiety is a predictive factor worth paying attention to in clinical decision making. Integrating information about current symptoms, medical history, and level of trait anxiety can be crucial to come to a genuine patient-tailored method in gallstone disease. Patients with high trait anxiety ought to be conversant about the high risk of continuing symptoms after cholecystectomy. Expectative administration ought to be considered. To decrease the amount of clinically ineffective cholecystectomies, guidelines for the indication of a cholecystectomy might be tightened, integrating new insights on the impact of personality.

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