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Preoperative patients' quality of life and outcomes after colorectal surgery

A prospective study

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Abstract

The aim of this prospective study was to assess the influence of preoperative life satisfaction on objective and subjective outcomes after elective colorectal surgery. Preoperative life satisfaction was assessed using a validated questionnaire (Échelle de Mesure des Manifestations du Bien-Être Psychologique). Postoperative quality of life was assessed by the Cleveland Global Quality of Life and QLQ-C30. Number of footsteps was recorded from preoperative day 5 to postoperative day 3. Physical activity, length of stay, and complications were compared between patients with low and high preoperative life satisfaction. Fifty patients were included. There was no difference between the 2 groups concerning postoperative objective (length of stay, complications, and number of footsteps) and subjective (Cleveland Global Quality of Life and QLQ-C30) recovery. In conclusion, preoperative life satisfaction of colorectal surgery patients had no influence on outcomes and physical activity in colorectal surgery.

Abbreviations: CGQL = Cleveland Global Quality of Life, EMMBEP = Échelle de Mesure des Manifestations du Bien-Être Psychologique, ERAS = enhanced recovery after surgery, QOL = quality of life.

Keywords: colorectal surgery, life satisfaction, quality of life, recovery

1. Introduction

Surgery has a significant impact on patient's quality of life (QOL), but preoperative QOL might also influence postoperative recovery.[1] Complications, recurrence rate, and survival are usually outcomes reported. However, from the patient's perspective, convalescence, well-being, and QOL are as important. Preoperative subjective condition of the patient is often a neglected factor which may impact postoperative recovery. There may also be a link between quality of life and negative clinical outcomes including suicidal behavior.[2] Indeed, despite the continuous advancement in neurosciences as well as in the knowledge of human behaviors pathophysiology, presently suicide represents a puzzling challenge.

An appropriate evaluation of QOL after surgery should consider both objective and subjective standpoints.[3] The European Organization for Research and Treatment of Cancer QLQ-C30 questionnaire has been recommended to measure QOL in oncological surgery. However, the importance of environmental factors, relationships, and general feelings of life satisfaction may be underestimated before the surgery. Recent reports pointed out the correlation between psychological and emotional factors before surgery and the recovery period.[4–6] Moreover, life satisfaction was shown to have a significant impact on recovery process in patients undergoing a variety of surgical procedures.[7]

It was our hypothesis that the outcomes may vary according to the quality of life. To determine this, the present prospective study assessed the impact of preoperative life satisfaction on subjective and objective postoperative recovery in colorectal surgery patients.

2. Methods

This study assessed secondary outcomes of a prospective study which included a cohort of non-selected elective colorectal patients operated from June 2016 to September 2018 at University Hospital CHUV in Lausanne, Switzerland.[8] Exclusion criteria were stoma closures and refusal to participate. Patients were treated according to the enhanced recovery after surgery (ERAS) protocol.[9]

Several psychometric instruments were used. Preoperative life satisfaction was assessed with the Canadian Échelle de Mesure des Manifestations du Bien-Être Psychologique (EMMBEP). It is a validated questionnaire which evaluates feelings in 6 areas,[10] namely attitudes toward the self, relations with others, self-

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The authors report no conflicts of interest.

The datasets generated during and/or analyzed during the current study are not publicly available, but are available from the corresponding author on reasonable request.

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regulation, environmental mastery, sociability, and happiness. Participants scored each of the 17 items using a 5-point scale varying from 0 (strongly disagree) to 4 (strongly agree). The global EMMBEP score was the sum of each question and then divided by 68. Postoperative QOL was assessed by the Cleveland Global Quality of Life (CGQL) at patient discharge.[11] Patients were asked to rate 3 items: current QOL, quality of health, and energy level. Each item was rated on a scale from 0 (worst) to 10 (best), and scores were added and divided by 30 to obtain the final score. The QLQ-C30 is another validated questionnaire assessing cancer-specific QOL and was used at patient discharge.[12] It includes 5 functional scales (physical, social, role, cognitive, and emotional functioning) and 9 symptom scales (fatigue, nausea/vomiting, pain, dyspnea, sleep disturbances, appetite loss, constipation, diarrhea, and financial impact) which are spread over 30 questions. Scores range from 0 (low) to 100 (high) after linear transformation of the raw scores.

Postoperative complications were graded according to the Clavien classification.[13] Medical complications were classified grade I or II, whereas complications requiring surgical treatment were classified grade III. Life-threatening complications or mortality were respectively graded IV and V. Length of stay (LOS) was calculated from operative day until the patient was discharged.

To assess physical activity, patients were paired with a connected wrist bracelets from preoperative day 5 to postoperative day 3. Daily footsteps were recorded and stored on an online software.

Descriptive statistics for categorical variables were reported as frequencies (%), whereas continuous variables were reported as means (standard deviation, SD). χ^2 test was used for categorical variables and Student *t* test for continuous variables. EMMBEP, QLQ-C30, and CGQL scores were correlated with recovery factors by use of the Pearson correlation coefficient.

The study was approved by the Institutional Review Board (CER-VD, protocol number 383/15) and registered in clinicaltrials.gov (NCT02610790).

3. Results

Fifty patients were initially included, and 3 patients were excluded because EMMBEP score was not available. Mean preoperative life satisfaction was 0.758 (SD = 0.16). Patients with low preoperative QOL (score $\leq$0.758) were compared to those with a high QOL (score >0.758) in a univariate analysis (Table 1). There was no difference between the 2 groups in terms of preoperative demographics, except a higher number of male patients in the group of low preoperative QOL. There was no difference between low and high QOL groups in terms of LOS (6.4 ± 5 vs 6.1 ± 3.4 days, respectively) and complications (7.9% $\pm$12% vs 9% $\pm$ 11.6%, respectively). Numbers of pre- and postoperative footsteps were no different.

Preoperative EMMBEP and postoperative CGQL of the entire cohort are shown in Fig. 1. Postoperative QOL with QLQ-C30 and CGQL score were not different between the 2 preoperative QOL groups. There was a significant correlation between QLQC-30 and postoperative footsteps ($r = -0.3$; $P = .048$) (Fig. 2). CGQL and QLQ-C30 scores were not correlated to preoperative number of footsteps, complications, and LOS.

4. Discussion

This prospective study did not show any relevant influence of preoperative QOL on postoperative LOS, complications, and physical activity. Therefore, our hypothesis that clinical outcomes were influenced by QOL was not verified.

In several studies, pre- and postoperative emotional state and QOL were important factors of postoperative recovery after surgery.[14] In this study, preoperative life satisfaction did not influence LOS and complications rates. In a prehabilitation study conducted in colorectal surgery, it has been showed that patients with improvement of their functional capacity had also improvements in mental health.[15] Furthermore, patients with depression and negative emotions might require a longer recovery time.[16] QOL has also been found to be associated with the risk of suicidal behaviors in elderly inpatients with surgical conditions.[17] A systematic review showed that anxiety and depression predicted poorer QOL and increased pain after surgery.[18] LOS could also be positively affected by subjective factors as patients' moods, pain, sleep, whereas complications may influence mental functions such as feelings but also physical functions. Although postoperative QOL assessed by QLQ-C30 was significantly correlated with postoperative physical activity in this present study, there was no correlation found in terms of LOS.

Table 1

Pre- and postoperative comparisons between patients with low and high preoperative life satisfaction according to the Échelle de Mesure des Manifestations du Bien-Être Psychologique.

	Low preoperative life satisfaction (n = 24)	High preoperative life satisfaction (n = 23)	*P*
Mean age (SD)	60 (18)	61 (17)	.40
Sex (M: F)	21:3	13:10	.04
ASA score (I, II: II, IV)	20:4	20:4	1.00
Alcohol consumption, n (%)	18 (75)	11 (23)	.07
Active smoking, n (%)	12 (50)	6 (23)	.13
Malignancy, n (%)	14 (58)	13 (57)	1.00
Laparoscopic approach, n (%)	20 (83)	21 (91)	1.00
Mean no. of preoperative footsteps (SD)	5914 (3365)	6396 (2526)	.29
Mean no. of postoperative footsteps (SD)	1257 (1293)	1232 (1642)	.48
Mean Cleveland score (SD)	0.5 (0.2)	0.6 (0.3)	.13
Mean QLQ-C30 score (SD)	58 (18)	58 (13)	.50
Mean length of stay (SD)	6 (5)	6 (3)	.41

SD = standard deviation.

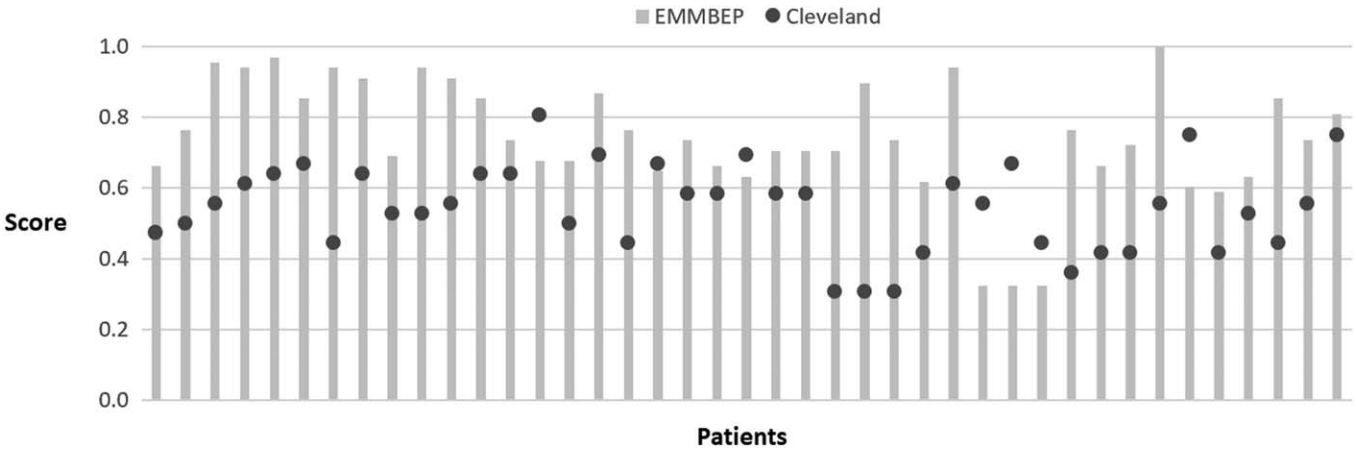

Figure 1. Preoperative life satisfaction (EMMBEP) and postoperative quality of life (Cleveland CGQL).

The involvement of sensory perception which is implicated in emotional processes and QOL after surgery is still poorly understood and there are few studies on the subject. Importantly, the unique sensory processing patterns of individuals have been reported as crucial factors in determining clinical outcomes and individual reactivity.[19]

The effect of life satisfaction could be masked in this cohort by a high level of compliance to the ERAS program. The optimized ERAS pathway and high prevalence of minimal invasive surgery at our center may have contributed to the reduction of surgical stress, and thus limiting the effect of QOL on postoperative outcomes. Indeed, an intensive conducted ERAS program might overcome and mask the effect of preoperative poor QOL through personalized support.[20] Although the results of the present study seem surprising, this is one of the first that attempt to correlate preoperative life satisfaction with objective and subjective postoperative outcomes in colorectal surgery.

Several limitations of the present study need to be discussed. Firstly, this is a retrospective study with a non-homogeneous population. Potential selection bias was also possible, whereas patients with better QOL and physical fitness might tend to participate in this kind of study. An overestimation of the physical activity was also possible, insofar as patients who became aware of having an accelerometer might be walking more. Furthermore, due to the lack of preliminary data, the sample size was estimated based on clinical considerations, which explains its small size and limits the interpretation and generalization of the results. Subgroup analyses were also limited by this small sample. Then, the correlation between mental health and outcomes may not be linear and not related to all type of complications. Larger prospective investigations are required to validate these relationships in colorectal surgery, but also in other disciplines. Even if the results were not significant, this present study is one of the few to have studied the impact of preoperative QOL on subjective and objective postoperative recovery. Traditional surgical and oncologic outcomes should be supplemented with measures of satisfaction and overall health-related QOL in future prospective studies, to assess the patient as a whole on the bio-psycho-social plan.

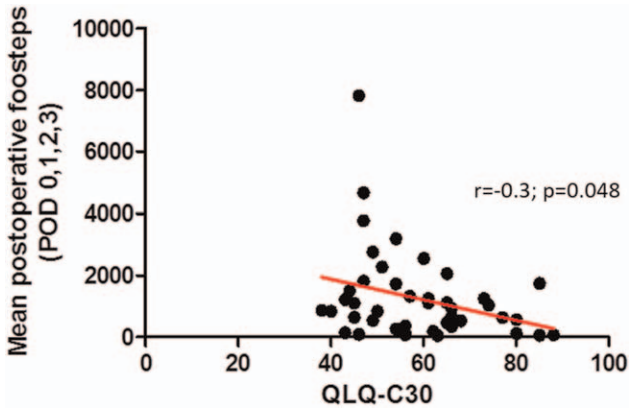

Figure 2. Correlation between quality of life (QLQ-C30) and footsteps during the first 3 postoperative days (POD).

5. Conclusion

This prospective study did not show any relevant influence of preoperative life satisfaction on objective and subjective postoperative recovery. A low preoperative life satisfaction should however be tracked down to propose targeted and personalized psychological management in patient's subgroup at risk of complications.

Author contributions

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