EVALUATION OF OUTCOMES FOLLOWING ERAS PROGRAMME IN LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Enhanced Recovery after Surgery (ERAS) is a multimodal perioperative care protocol designed to decrease major morbidity and promote accelerated postoperative recovery. ERAS guidelines are emerging for areas outside the original area of colorectal surgery. Selected componentsof ERAS are applied for selected surgical procedures.All the patients who underwent laparoscopic cholecystectomy from 1st August 2016 to 30th July 2017 at department of surgery, Nepal Medical College and Teaching Hospital were evaluated in this prospective randomized study. Among the 204 patients enrolled, mean age, BMI, operative time, pain score, doses of top up analgesia, hospital stay, time to ambulation and tolerance of oral feeding were comparable between the two groups. The patients in ERAS group had better score for sadness (ERAS: 1.2±0.42 and Conventional : 1.4±0.68 , p = 0.004) , ability to stand (ERAS : 2.8±0.41 and Conventional: 1.9±0.6 , p= 0.001) and mean impact on work stand (ERAS : 1.7±0.4and Conventional: 1.9±0.2, p= 0.008). Postoperative nausea vomiting was more in the conventional group (ERAS: 8,Conventional:20, p=0.015). Overallfeeling of wellbeing was better in ERAS group and more patients in this group opted to go home after 24 hours (ERAS: 27, Conventional:14, = 0.002). In conclusion, implementation of ERAS protocol enhances postoperative recovery, improves patient's satisfaction and reduces postoperative nausea vomiting and depression in patients undergoing laparoscopic cholecystectomy.

KEYWORDS

Cholecystectomy, ERAS, pain,
Postop QRS, recovery

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INTRODUCTION

Major GI surgeries generally involve a prolonged hospital stay and one week is usually the minimum that can be expected. [1] This prolonged hospital stay is not usually due to postoperative complications but to the conventional perioperative care protocol followed. Inadequate pain management, intestinal dysfunction and immobilization have been recognized since 1997 as among the main factors delaying postoperative recovery in patient subjected to major surgery .[2]This led Kehlet*et. al.* to propose an evidence based multidisciplinary action protocol, known initially as fast-track or better called Enhanced Recovery Programs (ERAS). However, ERAS is not achieving the degree of implantation hoped for. [3, 4]In this era of minimal access and fast track surgery, patient undergoing laparoscopic cholecystectomy prefer to stay at hospital for shorter period and resume to work as early as possible. Implementation of ERAS protocol has shown better patient satisfaction and feeling of wellbeing after surgery. This study was carried out to implement perioperative interventions according to ERAS protocols to optimize perioperative recovery after laparoscopic cholecystectomy.

MATERIALS AND METHODS

This was a prospective randomized study conducted at department of surgery, Nepal Medical College and Teaching Hospital from 1st August 2016 to 30th July 2017. All the patients who underwent laparoscopic cholecystectomy during this period were included in this study.

Patients were randomized into two groups by simple odd even number randomization technique.All patients got a serial number starting from 1. First case was allocated into group A, then all odd serial number were included in group A and even serial number in group B. The patients were given verbal and written information regarding ERAS protocol and a signed consent was taken. The patients in the group A received conventional perioperative care plan and ERAS perioperative care plan was given to the patients in the group B which included carbohydrate solution 12 hours and 6 hours prior to the surgery, ambulation within 6 hours of surgery, liquid diet started after 6 hours of surgery, oxygen supplementation at the rate of 6 liters/min for 2 hours by mask andthenat2liters/min by cannula for 4 hours irrespective of oxygen saturation detected by the probe, and intravenousparacetamol(no parenteral opiates). Diabetic patients, conversion to open and breach of protocol were excluded from the study. The patients on oral analgesia, withmobilization reaching pre-surgical level, tolerating solid food, passing gas and stool, without nausea, and mostimportantly patients wanting to go home were discharged. The patient had first follow up visit 7 to 10 days after surgery. Outcome analysis were compared between the groups regarding postoperative recovery(pain score, time to ambulation), postoperative nausea vomiting, complications (wound related and systemic) and hospital stay.

RESULTS

Total 204 patients who underwent laparoscopic cholecystectomy were included in the study. Most of the patients were female 78% (n=158). Equal number of patients were distributed in the ERAS group and conventional group (n=102 in each group). Mean age was 45.3±3.6 years (16-80) and age was similar in two group (ERAS =44.6±13.1, conventional = 44.9±14.2). The mean BMI was 24.7± 3.1 (19.3-30.2) and it was comparable in two groups. The mean operative time was 34.5 ±6.5 (25-60) minutes, hospital stay was 45.5±5.7 hoursand time to ambulation was 7.9±0.8 hours. (Table 1) Oral feeding was started after 6 hours and normal diet was resumed at 24 hours surgery in all patients.

Table 1: Baseline clinical parameters

Clinical parameters	ERAS	Conventional	P value
Operative time	33.6±5.7	35.3±7.1	>0.05
Hospital stay	44.1±7.8	46.0±5	>0.05
Time to ambulation	8±0.92	7.9±0.69	>0.05

The mean pain score was comparable in the two groups (ERAS: 1.4±0.6, Conventional: 1.5±0.7) and the mean doses of top up analgesia given was also similar in the two groups.However , the patients in ERAS group had better score for sadness (ERAS: 1.2±0.42 and Conventional : 1.4±0.68 , p = 0.004) , ability to stand (ERAS : 2.8±0.41 and Conventional: 1.9±0.6 , p= 0.001) and mean impact on work stand (ERAS : 1.7±0.4and Conventional: 1.9±0.2, p= 0.008) and the difference was statistically significant . (Table 2)

Table 2: Comparison of PostopQRS scores

Mean score at 24 hours	ERAS group	Conventional group	P value
Mean pain score	1.4±0.6	1.5±0.7	0.42
Top up analgesia (mean doses)	1.1±1.0	1.2±1.04	0.54
Mean sadness score	1.2±0.42	1.4±0.68	0.004
Mean ability to stand score	2.8±0.41	1.9±0.6	0.001
Mean impact on work score	1.7±0.4	1.9±0.2	0.008

Postoperative nausea vomiting was noticed more frequently in conventional group (ERAS: 8, Conventional: 20, p=0.015). Overall feeling of wellbeing was better in ERAS group and more patients in this group opted to go home after 24 hours (ERAS: 27,Conventional:14, = 0.002). (Table 3)

Table 3: Comparison of outcome parameters

Outcome parameters		ERAS group	Conventional group	P value
Postoperative nausea vomiting	Yes	8	20	0.015
	No	94	82	
Willing to go home at 24 hours	Yes	27	14	0.02
	No	75	88	

DISCUSSION

Enhanced recovery after surgery (ERAS) is an optimized well-structured protocol that is designed to reduce surgical stress and prepare patient for the surgery to fasten postoperative recovery. [5] ERAS protocol covers all three phases of perioperative surgical care and focus on factors such as prolonged bed rest, delayed return of normal bowel function, need for intravenous analgesia that usually cause delay in recovery, increase length of hospital stay and specialist intervention after surgery. [6]There are some key factors of an ERAS programme which differ from the conventional surgical approach. Patients are given high carbohydrate drinks pre-operatively and normal diet will be started as quickly as possible postoperatively. Early mobilization is encouraged after surgery (within a few hours if operation is in the morning). Anesthesia has an important part to play in the whole process, with the use of regional anesthesia for more effective pain control and keeping usage of opiates to a minimum. The basic components of ERAS can be tailored to surgery specific protocols. The recommendations are based on good quality randomized controlled trials or meta-analysis of them .[6,7,8,9]For homogeneity of the population and minimization of bias, we selected only patient undergoing laparoscopic cholecystectomy. Laparoscopic cholecystectomy has been practiced as a day care surgery since long even with conventional perioperative care plan. However, implementation of ERAS had significantly improved patients feeling of well being. Patients receiving ERAS protocol could ambulate without support and do activities to take care of themselves earlier compared to conventional group. Patients in ERAS group were more satisfied at 24 hours with fewer incidences of postoperative nausea/ vomiting aftersurgery. Higher number of patients in ERAS group was ready to go home at 24 hours after surgery.Although recent meta-analyses proved that ERAS has a better outcome compared with conventional postoperative care, there is still a lack of standardization in these studies which hinders achievement of higher levels of evidence.[10-13] The main problem is the multidisciplinary integration of ERAS into routine clinical care, challenging surgeons, anesthetists, nurses, and other involved health care professionals. [14,15]Although ERAS significantly decreases length of stay (LOS) and the overall occurrence of complications, compliance with its protocol in daily clinical practice worldwide is not optimal .[12,16] Following numerous clinical studies, Lassen et al. summarized 20 treatment components as Consensus Guidelines, which need to be considered when ERAS is used in clinical practice. Fifteen out of 20 components reached evidence grade A in ERAS. [12]Severalpublications mention different ERAScomponents that have been included into their protocols, highlighting the ongoing evolution of ERAS protocols. Ahmed et al. have performed an interesting systematic review of the compliance with ERAS components. [12]They identified 19 ERAS modalities partially differing from the Consensus Guidelines (20 components) and included 11 clinical trials. The review showed that none of the trials included all 19 ERAS components in their protocols. In fact, they identified a maximum of 14 components included by Ramirez *et al.*, 13 modalities included by Nygren*et al.* whereasSchwenk*et al.* and Kahokehr*et al.*considered only 4 components. [17-19]Ahmed *et al.*reported that both clinical implementation (components not reported or included in the ERAS protocol) and compliance (in percent) showed widespread variation among the clinics, highlighting the necessity of further standardization.[12]This improved the evidence in ERAS protocols, as shown in a recent Cochrane meta-analysis including only 4 RCTs .[11]Although a high compliance with the ERAS protocol is clearly correlated with improved outcome after surgery , pure facts do not seem to be convincing. [12]

Conventional perioperative care is based on personal experiences and traditional surgical teachings, however growing amount of research in different aspect of perioperative care made ERAS protocol more evidenced based and able to comment on those practices which are unnecessary or even halt postoperative recovery in surgical patients. Most of the recent trials focusing on ERAS protocol and outcomes are able to show reduced length of hospital stay along with decreased morbidity.[20]

The results that can be achieved with ERAS i.e. reductions in postoperative morbidity, average length of hospital stay and the consumption of resources – are significant and the general implantation of an ERAS isrecommendable. [21-23] Unfortunately, the results communicated regarding surgery in an ERAS context have nearly all come from individual institutions, although they include those of fourrandomized clinical trial. [20,21,24-26] Recently, the results of an international study (five hospitals in different countries, four with no prior experience in ERAS) reportingon patient follow-up, the degree of acceptance and the degree of compliance with the protocol of a common ERAS, have also become available. [22]The results ofthese studies suggest that just making a protocol available is insufficient for objectives to be achieved;changes also need to be made to organizational strategiesand the medical professionals involved in pre, intraand especially postoperative care require support via continuing education.[24-27]

In our study we improvised a simple and convenient perioperative care plan including only five ERAS components(preoperative carbohydrate loading, early postoperative feeding, early ambulation, continuous oxygenation for 6 hours and intravenousparacetamol for pain management.The patient's satisfaction was measured using PostopQRS scale. This is a simple and easily reproducible tool to assess postoperative recovery after surgery. [28]In this study we found no difference in mean postoperative pain score, need of analgesia tolerance to oral feeding and length of hospital stay between the two groups. However, our patients in ERAS group had significantly lower incidence of postoperative nausea /vomiting, less postoperative depression and better overall satisfaction at 24 hours after surgery. This was shown by significant number of patients in ERAS group choosing to go home at 24 hours. Hence, with the analysis of the results of our study we could demonstrate significant advantage of applying ERAS protocol in patients undergoing laparoscopic

cholecystectomy. In conclusion, implementation of ERAS protocol enhances postoperative recovery, improves patient's satisfaction and reduces postoperative nausea vomiting and depression in patients undergoing laparocopic cholecystectomy.

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