

ORIGINAL ARTICLE

Institutional variations in nutritional aspects of enhanced recovery pathways after elective surgery for colon cancer

Fotios Seretis¹, Panagiota Kaisari², Kasun Wanigasooriya³, Edward Rawstorne³, Charalampos Seretis¹

¹Department of General Surgery, Hampshire Hospitals NHS Foundation Trust, Basingstoke, United Kingdom; ²Eating Behaviour Research Group, University of Birmingham, United Kingdom; ³Department of General Surgery, Heart of England NHS Foundation Trust, Birmingham, United Kingdom

Summary

Purpose: Perioperative nutritional optimisation is one of the key aspects of the Enhanced Recovery after Surgery (ERAS) pathway after elective colorectal cancer resections. Despite the general acceptance of ERAS as a safe and cost-effective perioperative care bundle, significant variations in terms of nutritional support exist among colorectal units. **Methods:** To assess these variations, we performed a cross-sectional online survey among colorectal surgical residents within a UK region.

Results: Our survey of practice demonstrated that despite the international recommendations, a considerable percentage of colorectal units would still advocate prolonged fasting

prior to surgery without routine use of carbohydrate loading, as well as delaying resumption of oral intake postoperatively. In addition, in almost one in five colorectal units, the patients would not be assessed by the specialist nutrition team for potential support during their hospitalisation.

Conclusion: Therefore, we believe that further education of the medical and allied health professional staff is required regarding the correct implementation of ERAS pathway guidelines after elective surgery for colorectal cancer.

Key words: colorectal cancer, enhanced recovery, ERAS, nutrition, surgery

Introduction

ERAS constitutes a bundle of perioperative care which has been proven to decrease postoperative morbidity, mortality and length of hospitalisation by improving numerous perioperative care parameters, including goal-directed fluid therapy, early mobilisation and early removal of drains, catheters, nutritional as well as analgesic optimisation [1]. ERAS has now been established as standard of care in various surgical specialities; however it is probably most popularised in the field of colon cancer surgery, where the majority of ERAS-related studies have been performed [2,3]. Although ERAS affects a wide spectrum of postoperative care parameters, one of the main

axes behind its rationale is the nutritional optimization prior to surgery with regular perioperative structured nutritional risk assessment and utilisation of enteral feeding as early as possible after the procedure [4,5].

In this framework, one of the cornerstones of ERAS in colon cancer surgery is the avoidance of prolonged preoperative fasting in combination with administration of oral carbohydrate loading regimen few hours before surgery [6]. Moreover, early introduction of enteral feeding in the first postoperative day is usually aimed, with avoidance or early removal of the nasogastric tube [7]. According to the current guidance as described

in a joint consensus statement by the UK ERAS Society, the International Association for Surgical Metabolism and Nutrition (IASMEN) and the European Society for Clinical Nutrition and Metabolism (ESPEN) [8] i) Clear fluids should be allowed up to 2 hrs and solids up to 6 hrs prior to induction of anesthesia, ii) Preoperative oral carbohydrate treatment should be used routinely, even in diabetic patients, iii) Postoperative nasogastric tubes (NGT) should not be used routinely and if inserted during surgery, they should be removed before reversal of anesthesia, iv) Preoperative fasting should be minimized and postoperatively patients should be encouraged to resume normal food as soon as possible after surgery, with *ad-hoc* use of oral nutritional supplements, v) Patients should be screened for nutritional status and, if deemed to be at risk of under-nutrition, should have active nutritional support. Of note, despite its proven value in improving the postoperative outcome, significant variations in practice are observed between different surgical departments, even at regional level.

The aim of this study was to detect these differences in practice via a cross-sectional study across UK-based colorectal units at regional level and assess the need for further auditing and education of the clinicians and allied healthcare professionals.

Methods

We performed a cross-sectional survey among general surgery trainees in colorectal surgery placements across West Midlands Deanery, UK. Our team developed an online response platform with a multiple option questionnaire and the latter was forwarded to the trainee members of the West Midlands Surgical Society. The responses were anonymous and data was saved on the online software for future analysis. The study responders could be of any training grade, provided that they were working within a colorectal unit. The study responders were asked to choose one of the available answers in a total of thirteen questions referring to the institutional practice on nutritional risk assessment and support in the perioperative period in patients undergoing elective surgery for colon cancer. In order to help interpretation of results, no open-type questions were included in the survey. Once completed, the same user could not log-in again to complete the survey to avoid repetition of results. The online platform remained active for one month and then further access was prohibited.

Results

A total of thirteen responses from regional

colorectal units in the West Midlands Deanery were received via the online platform; 43% of the responders were in university-affiliated hospitals. Of note, in only 77% of the participating centres ERAS was adopted as standard perioperative bundle of care in cases of elective surgery for colon cancer. Moreover, less than half (46%) of those institutions routinely using ERAS after colon cancer surgery had a formal, structured protocol that would be expected to be implemented by the surgical, anaesthetic and critical care teams.

With respect to the nutritional aspects of ERAS, in 61.5% of the participating centres there was no structured nutritional screening in the context of surgical preassessment. Also, the recommended administration of preoperative carbohydrate loading oral supplements on the morning of surgery was standard practice in only 76.3% of the cases. In terms of preoperative allowance of oral intake, patients were asked to fast for 2, 4 and 6 hrs prior to surgery in 61.5%, 15.4% and 23.1% respectively from clear fluids. Solid food was allowed up to 6 or 8 hrs prior to surgery in 77% and 23% of the cases respectively. With respect to the use of nasogastric tubes, in all the participating units (100% compliance), the anaesthetic team would routinely remove the nasogastric tubes in the immediate postoperative period.

In terms of resumption of oral intake after surgery, in 75% of institutions patients were allowed to have oral fluids on the day of surgery, while in the remaining 25% of the units, oral fluids would be started on the first postoperative day. Regarding oral diet, in 33.3% of the units, intake of solids would be allowed on the day of surgery; in 50% and 16.7% of the participating centres, diet would be commenced on the first or second postoperative day respectively. Finally, review of the patients in the postoperative period by the nutrition team would be performed as part of a routine protocol in 67% of the participating centres and only upon request from the parent colorectal team in the remaining centres.

Discussion

ERAS has contributed to the improvement of perioperative care after colorectal cancer surgery and has been demonstrated by various studies that its implementation is associated with decrease in overall length of stay, as well as with the postoperative morbidity and mortality, and eventually resulting in significant reduction of healthcare costs [9]. Having started as a more liberal post-

operative approach with early removal of catheters and drains, early mobilisation of the patients, rationalisation of the administered fluid volumes and optimisation of postoperative analgesia and fundamentally with early introduction of enteral feeding and structured nutritional support, ERAS is now accepted as the standard of care, even in special populations as the elderly [10]. Our anecdotal experience in colorectal units though has demonstrated that despite the clear guidance issued by international associations with expertise on this field, such as the UK ERAS Society, the International Association for Surgical Metabolism and Nutrition (IASMEN) and the European Society for Clinical Nutrition and Metabolism (ESPEN) [8], there is significant variation regarding the adherence to ERAS principles. Remarkably, although the early removal of abdominal drains, nasogastric and urinary catheters, along with goal-directed fluid therapy have been well established, we noted the presence of considerable inter-institutional variations in terms of the nutritional risk assessment and support as by ERAS recommendations, even when referring to colorectal units within close geographical proximity and overlapping population catchment areas.

Our cross-sectional survey aimed to identify these different perceptions in terms of perioperative nutritional support and highlight the need for further standardization of care and continuous education of the clinicians and allied health professionals involved in the care of patients after elective colorectal cancer surgery. To put in a nutshell, we demonstrated that approximately in one quarter of the responding colorectal departments, ERAS was not used routinely as care pathway. Moreover, there was significant deviation from the internationally recommended standards regarding the use of carbohydrate loading oral supplements prior to surgery and also a notable number of units are still adherent to the traditional perception of prolonged fasting preoperatively from both solids and even clear fluids. Equally, our survey demonstrated notable hesitation in resumption of oral feeding in the early postoperative phase. In addition, in approximately one out five colorectal units, the patients would not be screened routinely before or after surgery for malnutrition and consideration of nutritional supplementation by the in-hospital nutrition and dietetics specialists. The only point of global agreement in the daily practice within the units was the early removal of the nasogastric tube immediately after the recovery from the general anesthesia.

To the best of our knowledge, our study is the first to specifically assess the adherence of specialist colorectal units to ERAS principles regarding the perioperative nutritional support of patients and, with the exception of the study published in 2010 by Arsalani-Zadeh and co-workers, is the only study within the last five years conducted among UK-based colorectal units that assesses the implementation extent of ERAS pathway parameters [11]. In the above-mentioned survey conducted among members of the Association of Coloproctology of Great Britain and Ireland (ACPGBI), the authors also had demonstrated that 50% of the responding surgeons would not use routinely oral carbohydrate loading prior to surgery and there was lack of compliance with the guidance with respect to preoperative fasting and resumption of oral fluids and commencement of diet. However, the interinstitutional variations about the calculation of nutritional risk assessment and supplementation in the perioperative period was not addressed in that study. Interestingly, similarly to our results, a large nationwide multi-institutional survey across gynecological oncology units in Germany revealed again that only half of the responding departments applied 70% of the nutritional ERAS pathway principles. Moreover, in accordance to our findings, a nationwide survey conducted by the Spanish Society of Anesthesiology and Critical Care in conjunction with the Spanish Association of Surgeons, the Spanish Society of Enteral and Parenteral nutrition & ERAS Spain demonstrated that less than 60% of the participating centers would routinely implement nutritional screening strategies and would utilize the recommended preoperative carbohydrate loading regimens prior to abdominal surgery [13].

Based on these facts, we believe that although our survey was conducted at a regional level, our findings reflect the presence of significant variations in terms of nutritional risk assessment and support within the ERAS framework implemented by specialist colorectal units after elective operations for colonic cancer. Nevertheless, the number of participating institutions is limited and geographically corresponds to a single geographical region, which could skew the perception about the standards of practice at a nationwide level. In addition, the fact that the survey was forwarded to active members of the regional surgical society could result in exclusion of units with no representatives in the association. On the contrary, our survey included only closed-type questions with

prefixed potential answers to aid with interpretation of the responses and duplication of participants was prohibited by the software itself. Hence, we believe that the findings of this pilot survey could be utilized as a stimulus for improving the education of the relevant surgical, anesthetic and critical care teams and emphasize the need for

continuous auditing of our performance against the internationally recommended nutritional care standards.

Conflict of interests

The authors declare no conflict of interests.

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