Editorial

A new clinical guideline for the application of enhanced recovery protocols (ERPs) in colorectal surgery: an update of the evidence levels for the measures to be applied?

Ana Belén Martínez Martínez[1], Javier Longás Valién[2], José Manuel Ramírez Rodríguez[3]

[1]Faculty of Health Sciences, University of Zaragoza, Zaragoza, Spain; [2]Department of Anesthesia, [3]Department of Surgery, Lozano Blesa Hospital, Zaragoza, Spain

Correspondence to: Ana Belén Martínez Martínez, PhD. Faculty of Health Sciences, University of Zaragoza, Domingo Miral s/n, 50.009 Zaragoza, Spain. Email: amarmar@unizar.es.

Comment on: Carmichael JC, Keller DS, Baldini G, *et al.* Clinical practice guideline for enhanced recovery after colon and rectal surgery from the American Society of Colon and Rectal Surgeons (ASCRS) and Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Surg Endosc 2017. [Epub ahead of print].

Received: 29 November 2017. Accepted: 27 December 2017; Published: 11 January 2018.

doi: 10.21037/ales.2017.12.06

View this article at: http://dx.doi.org/10.21037/ales.2017.12.06

Enhanced recovery protocols (ERPs), also known as fast-track or enhanced recovery after surgery (ERAS) protocols, were first developed by Professor Henrik Kehlet in the 1990s with a clear objective, namely to improve the recovery of surgical patients by following a multimodal strategy aimed at reducing in-patient complications and surgical stress by way of a series of pre-, peri- and postoperative measures and care.

Since they were first introduced, numerous benefits, such as rapid recovery and less postoperative pain, have been demonstrated due to the application of such protocols, with these benefits resulting in improved patient care and a reduction in hospital costs due to the need for shorter in-patient stays (1).

Indeed, although these protocols were first introduced into colorectal cancer surgery, they have since been extended to other oncological fields, such as gynaecological (2), bariatric (3) and hip and knee surgery (4), given the marked benefit observed in terms of patient recovery, with a reduction in the comorbidities and complications associated with the surgical intervention.

Despite this, the application and development of such protocols is not completely problem-free due to the need for a cross-sectional approach involving various specialities. As such, a multidisciplinary team comprising surgeons, anaesthetists, nurses and nutritionists, amongst others, must be formed. It became clear soon after development of the very first protocols that they should be based on recommendations rather than instructions, with their application depending on the needs and resources of each hospital interested in applying them. In this regard, various societies have taken on the role of disseminating and implementing ERPs by establishing recommendations for the measures to be adopted based on the level of evidence available for each. These include the ERAS society (5,6) internationally, and other national societies such as the Spanish Society for Enhanced Recovery (SSER/GERM) group (7) in Spain.

The latest guideline to be published was authored by the American Society of Colon and Rectal Surgeons (ASCRS) and Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) (8). The need for new guidelines is based on the fact that ERPs must be constantly reassessed. As they are based on evidence-based medicine, they must be regularly updated. On this occasion, controversial aspects concerning perioperative management have been updated given the widely differing results reported in the various studies published.

The guideline has been drafted on the basis of a systematic literature review of current guidelines and search keywords for the period 1990 to 2016. Preference was given to prospective studies, randomised studies, controlled clinical trials and systematic reviews. Finally, recommendations for each of the preoperative,

intraoperative, or peri- and postoperative periods are provided, depending on the levels of evidence observed.

Regarding the preoperative period, the guideline provides a new focus related to the need to explain the discharge criteria to patients at the start of the process, along with all the information concerning the procedure they are about to undergo. At this point, the guideline highlights a situation that is rather more common in clinical practice than would be wished, that is the often large discrepancies between the stage at which patients comply with the discharge criteria and the time when they are actually discharged. In light of this, there is a clear need to establish defined discharge criteria and ensure that they are complied with in clinical practice as this would allow results to be homogenized. It appears reasonable that the establishment of discharge criteria may allow results to be standardized, thus allowing a comparison to be made between different protocols applied (9,10).

In addition, the guideline establishes the need to discuss a specific point, namely ileostomy, with patients, and does so as a strong recommendation. In other guidelines, this aspect formed part of the preoperative information rather than representing an isolated recommendation. It is clear that an ileostomy represents a lifestyle change for the patient. Moreover, it requires an adaptation on the part of patients, therefore the more information received the better they will be prepared, although it is debatable whether this aspect should be included in the recommendations of an ERP guideline or would be better presented as part of good medical practice or preoperative advice.

Additionally, the guideline does not mention aspects as important as how to deal with smoking or drinking habits, preoperative glycaemia management, haemoglobin levels or prior evaluation of the patient's nutritional status, all of which are strongly recommended in the ERAS guidelines (11,12).

Concerning mechanical bowel preparation (MBP), the ERAS recommendations provide high degree of evidence and a strong recommendation for no MBP. However, the guideline provides more recent evidence supporting MBP prior to surgery provided it is supplemented with antibiotics (13). This fact should be taken into consideration in future guidelines.

As for the indication for providing clear liquids up to two hours prior to surgery if there is no risk of delayed gastric emptying, this recommendation was already established in the previous guidelines with the same level of evidence and grade of recommendation.

It is interesting to note that there is some evidence suggesting that the use of perioperative protocols is insufficient to ensure optimal results and that they should be applied in all three periods, avoiding partial implementation, although the evidence level is low and the established recommendation is weak (14).

Finally, the need for clinical trials to increase the level of evidence concerning one of the aspects of preoperative management which may become relevant in the future, specifically the need for prehabilitation, a preoperative action comprising physical, nutritional and cognitive therapy, should be highlighted. One aspect that cannot be brought into question is the fact that the increasingly sedentary lifestyle of the population increases overall morbidity and mortality. Indeed, the WHO has established that physical exercise combined with a healthy lifestyle, including adequate nutrition and an optimal cognitive status, is a key therapeutic tool for reducing the risk of suffering non-transmittable chronic diseases (15). The surgical process is a period in which patients are receptive to the introduction of healthy habits into their lifestyle. As such, a preoperative optimization in which patients play an active part and is appropriately monitored by a healthcare professional improves their functional status and, indeed, the literature is beginning to show that this is becoming a key point for reducing postoperative complications (16-18).

The perioperative advice section stresses various aspects. The first recommendation is the importance of establishing a series of measures aimed at reducing surgical infection. These include intraoperative measures, such as the use of surgical wound protectors and changing gloves prior to fascial closure, and postoperative measures, such as daily washing of the wound with chlorhexidine. According to the authors, these measures differ between the various protocols, therefore it is difficult to establish the role played by each (19).

The guideline also fails to discuss aspects such as the need for anxiolytic premedication, measures aimed at thromboprophylaxis or antibiotic therapy and the need to extend it depending on the half-life of the antibiotic used. These are all aspects for which the ERAS guideline establishes a strong recommendation based on a high level of evidence.

As regards pain control, it is recommended to establish a preoperative multimodal analgesia plan aimed at reducing opiate use as these substances have been associated with an increase in hospital stays. The use of non-steroidal anti-inflammatories, acetaminophen, or drugs such as gabapentin, ketamine or alpha-2 agonists is recommended.

The use of thoracic epidural-based analgesia should be limited to open surgery, with infusion of a mixture of local anaesthetics and lipophilic opiates being recommended. A strong recommendation based on moderate levels of evidence is established for these aspects. The ERAS guideline establishes the same recommendation based on high levels of evidence for the same aspects.

With regard to the use of transversus abdominis plane (TAP) block, the authors question the use of this technique as first option given the lack of sufficient supporting evidence, limiting its use to the failure or contraindication for epidural anaesthesia, and always prior to surgery (20).

Antiemetic prophylaxis, which should be based on a preoperative screening of the risk factors, is another important aspect of perioperative management, although its recommendation is weak despite a moderate level of evidence having been observed. Prophylaxis should be administered in all high-risk patients. The combination of dexamethasone with other antiemetic results in a higher degree of protection than the use of other antiemetics alone (21). The ERAS guideline establishes these recommendations with the same level of evidence.

One of the most widely discussed aspects in other guidelines is the management of intraoperative fluids. The authors are clear in this regard and, based on a literature update, recommend that an excess of intraoperative fluids should be avoided and the use of chloride-rich crystalloid solutions should be limited. The use of objective-guided therapy is only recommended in high-risk patients. Their use in major surgery and in procedures in which significant intravascular blood loss in expected is also considered in this point (22).

The final aspect of the intraoperative period discussed is the technique to be used, with minimally invasive surgery being preferred provided the personnel responsible for the surgical procedure have sufficient experience with that technique. Intra-abdominal drains and use of nasogastric tubes should be avoided whenever possible. Similar recommendations can be found in the ERAS guideline.

As far as postoperative measures are concerned, early mobilization of patients is recommended, in agreement with many other published guidelines (7,8). Postoperative ileus is one of the most common complications and one of those with the highest morbidity of the postoperative period, therefore the authors recommend various preventive measures, such as an early feeding, the use of chewing gum and, finally, treatment with alvimopan in open surgery, with a moderate level of evidence and strong recommendation (23).

Another important point concerns postoperative fluid therapy, with early discontinuation of intravenous therapy and close monitoring of excess supply using the patient's weight being recommended.

The final aspect covered is the use of urinary catheters, with restriction of the use thereof in the 24 hours post-surgery being recommended in elective colon surgery and upper rectal resection. Removal after 48 hours is recommended for middle and lower rectal resections. This is a strong recommendation with a moderate level of evidence (24).

In light of the above, this new guideline updates many of the 21 points established in the ERAS guideline, providing new evidence for previously controversial aspects, such as MBP, perioperative fluid therapy or prophylaxis for postoperative ileus. However, more attention should have been paid to overall perioperative management and, in our opinion, aspects such as antithrombotic prophylaxis or perioperative antibiotic therapy should have been updated.

The need to periodically review the literature evidence should allow the development of new clinical guidelines supported by scientific societies. One important aspect that should be revised is the need to homogenize the fundamental aspects that should appear in a guideline in order to allow a comparison of the various guidelines published. However, we are aware that, although the varying operation of the different healthcare systems found worldwide makes such a standardization particularly difficult, unless this task is carried out it will be impossible to study the scientific evidence for the measures adopted in a reliable manner.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Annals of Laparoscopic and Endoscopic Surgery*. The article did not undergo external peer review.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/ales.2017.12.06). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related

to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References

1. Kehlet H, Wilmore DW. Fast-track surgery. Br J Surg 2005;92:3-4.
2. Nelson G, Dowdy SC, Lasala J, et al. Enhanced recovery after surgery (ERAS®) in gynecologic oncology–Practical considerations for program development. Gynecol Oncol 2017;147:617-20.
3. Blanchet MC, Gignoux B, Matussière Y, et al. Experience with an Enhanced Recovery After Surgery (ERAS) Program for Bariatric Surgery: Comparison of MGB and LSG in 374 Patients. Obes Surg 2017;27:1896-900.
4. Zhu S, Qian W, Jiang C, et al. Enhanced recovery after surgery for hip and knee arthroplasty: a systematic review and meta-analysis. Postgrad Med J 2017;93:736-42.
5. Gustafsson UO, Scott MJ, Schwenk W, et al. Guidelines for perioperative care in elective colonic surgery: Enhanced Recovery After Surgery (ERAS®) Society recommendations. Clin Nutr 2012;31:783-800.
6. Nygren J, Thacker J, Carli F, et al. Guidelines for perioperative care in elective rectal/pelvic surgery: enhanced Recovery After Surgery (ERAS(R)) Society recommendations. Clin Nutr 2012;31:801-16.
7. Vía Clínica de Recuperación Intensifcada en Cirugía Abdominal (RICA). Available online: http://portal.guiasalud.es/contenidos/iframes/documentos/opbe/2015-07/ViaClinica-RICA.pdf
8. Carmichael JC, Keller DS, Baldini G, et al. Clinical practice guidelines for enhanced recovery after colon and rectal surgery from the american society of colon and rectal surgeons (ASCRS) and society of american gastrointestinal and endoscopic surgeons (SAGES). Surg Endosc 2017. [Epub ahead of print].
9. Maesen J, Dejong CH, Hausel J, et al. A protocol is not enough to implement an enhanced recovery programme for colorectal resection. Br J Surg 2007;94:224-31.
10. Maessen JM, Dejong CH, Kessels AG, et al. Length of stay: an Inappropiate readout of success of enhanced recovery programs. World J Surg 2008;32:971-5.
11. Nelson G, Altman AD, Nick A, et al. Guidelines for pre- and intra-operative care in gynecologic/oncology surgery: enhanced recovery after surgery (ERAS®) society recommendations--part I. Gynecol Oncol 2016;140:313-22.
12. Nelson G, Altman AD, Nick A, et al. Guidelines for postoperative care in gynecologic/oncology surgery: enhanced recovery after surgery (ERAS®) society recommendations--Part II. Gynecol Oncol 2016;140:313-22.
13. Toneva GD, Deierhoi RJ, Morris M, et al. Oral antibiotic bowel preparation reduces length of stay and readmissions after colorectal surgery. J Am Coll Surg 2013:216:756-62;discussion 762-3.
14. ERAS Compliance Group. The impact of enhanced recovery protocol compliance on elective colorectal cancer resection: results from an international registry. Ann Surg 2015;261:1153-9.
15. World health report 2002. Reducing risks, promoting healthy life. Geneva: World Health Organization, 2002.
16. Gillis C, Li C, Lee L, et al. Prehabilitation versus rehabilitation: a randomized control trial in patients undergoing colorectal resection for cancer. Anesthesiology 2014:121:937-47.
17. Pouwels S, Stokmans RA, Willigendael EM, et al. Preoperative exercise therapy for elective major abdominal surgery: a systematic review. Int J Surg 2014;12:134-40.
18. West MA, Loughney L, Lythgoe D, et al. Effect of prehabilitation on objectively measured physical fitness after neoadjuvant treatment in preoperative rectal cancer patients: a blinded interventional pilot study. Br J Anaesth 2015;114:244-51.
19. Keenan JE, Speicher PJ, Thacker JK, et al. Effect of prehabilitation on objectively measured physical fitness after neoadjuvant treatment in preoperative rectal cancer patients: a blinded interventional pilot study. West MA, Loughney L, Lythgoe D, et al. Effect of prehabilitation on objectively measured physical fitness after neoadjuvant treatment in preoperative rectal cancer patients: a blinded interventional pilot study. Br J Anaesth 2015;114:244-51.
20. Leurcharusmee P, Arnuntasupakul V, Chora De La Garza D, et al. Reliability of waveform analysis as an adjunct to loss of resistance for thoracic epidural blocks. Reg Anesth Pain Med 2015;40:694-7.
21. Kappen TH, Vergouwe Y, van Wolfswinkel L, et al. Impact of adding therapeutic recommendations to risk assessments from a prediction model for postoperative nausea and vomiting. Br J Anaesth 2015;114:252-60.
22. Pearse RM, Harrison DA, MacDonald N, et al. Effect of a perioperative, cardiac output-guided hemodynamic therapy

algorithm on outcomes following major gastrointestinal surgery: a randomized clinical trial and systematic review. JAMA 2014;311:2181-90.
23. Wallstrom A, Frisman GH. Facilitating early recovery of bowel motility after colorectal surgery: a systematic review. J Clin Nurs 2014;23:24-44.
24. Simorov A, Thompson J, Oleynikov D. Alviopan reduces length of stay and costs in patients undergoing segmental colonic resections: results from multicenter national administrative database. Am J Surg 2014;208:919-25.

doi: 10.21037/ales.2017.12.06
Cite this article as: Martínez Martínez AB, Valién JL, Ramírez Rodríguez JM. A new clinical guideline for the application of enhanced recovery protocols (ERPs) in colorectal surgery: an update of the evidence levels for the measures to be applied? Ann Laparosc Endosc Surg 2018;3:3.

