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Introducing Enhanced Recovery After Surgery for Colorectal Procedures:
Development of an Enhanced Recovery After Surgery Protocol

Vincent C. Compton BSN, RN

Introduction of the Problem

The National Center for Health Statistics estimated a total of 247,000 patients required colorectal surgery in the United States in 2010 (Centers for Disease Control and Prevention, [CDC], 2012). Approximately 115,000 of those patients were greater than the age of 65 (CDC, 2012). In 2012, there were 43.1 million Americans who were 65 years of age or older and this population is expected to double to a staggering 83.7 million by the year 2050 (Ortman, Velkoff, & Hogan, 2014). Consequently, an aging population presenting with various comorbidities yields an increased incidence of surgical complications. Thus, the development of enhanced recovery programs was initiated to improve patient outcomes and decrease financial strain.

Literature Review

ERAS has contributed significant changes within each phase of the surgical experience. Key components include preoperative optimization, avoidance of preoperative bowel prep, fasting and carbohydrate loading, premedication, a standardized anesthetic protocol, perioperative fluid management, multimodal analgesia, ileus prophylaxis, and early mobilization and feeding (Horosz, Nawrocka, & Malec-Milewska, 2016). Preoperative optimization is described as increased physical efficiency and exercise tolerance before surgery which has been associated with improved outcomes postoperatively (Horosz et al., 2016). The result is shortened hospital stays and improved quality of life. Additional components of optimization include increased water consumption, avoiding radical diets, smoking cessation, and abstinence from alcohol one month prior to the scheduled surgery. The utilization of ERAS also discredits the use

of mechanical bowel prep (MBP). MBP is associated with the adverse physiological effects of dehydration, patient distress, and an increased incidence of prolonged postoperative ileus (Gustafsson et al., 2012). Incorporation of this technique would be in direct contrast to the patient's preoperative optimization of increased hydration and avoidance of radical diets. Thus, ERAS challenges the traditional method and mindset of fasting. The patient is allowed to arrive at the operating room in a hydrated and euvolemic state and is encouraged to maintain clear liquid intake up to two hours before surgery (Miller et al., 2015). Specifically, the patient should ingest 400 ml of clear carbohydrate-rich liquid two hours before induction. The combination of reducing the fasting period and carbohydrate loading enables the patient to enter the operating room in a "fed" state, reducing preoperative hunger, thirst, and anxiety (Miller et al., 2015). Additionally, enhanced recovery urges the use of a standard anesthetic protocol allowing for rapid awakening. Vigilant control of fluid therapy, analgesia, and hemodynamic changes must occur to reduce the resulting metabolic stress response. Effective implementation of enhanced recovery requires minimal intraoperative fluid administration which should be used only to maintain hemodynamic stability and replace blood loss (Horosz et al., 2016). Vigilant control of analgesia utilizes a multimodal technique to optimize intraoperative and postoperative pain. Pain results in adverse clinical implications including prolonged time to recovery milestones and increased length of hospital stay (Tan, Law, & Gan, 2015). Additionally, opioid-based regimens produce increased sedation, PONV, urinary retention, ileus, and respiratory depression, prolonging discharge (Tan et al., 2015). The risk of ileus is further reduced by the incorporation of mid-thoracic epidural analgesia, avoidance of fluid overload and nasogastric decompression, the administration of oral alvimopan, magnesium, and chewing gum postoperatively. Lastly, virtually all ERAS protocols incorporate "enforced" or "structured" mobilization on

postoperative days one through three (Feldheiser et al., 2016; Gustafsson et al., 2012). Failure to mobilize carries significant risks including pneumonia, insulin resistance, thromboembolism, and muscle weakness (Gustafsson et al., 2012).

The listed facets of ERAS aim to decrease surgery-induced metabolic stress, facilitate return of bowel function, and reduce length of stay in a cost-effective manner (Horosz, Nawrocka, & Malec-Milewska, 2016). Furthermore, ERAS strives to decrease opioid administration which produces a cascade of negative variables. The current surgical trend to decrease postoperative narcotic dosing has led to the full optimization of the patient prior to incision. Thus, allowing ERAS to be customized to the needs of each patient and the capabilities of the facility when a team-based approach is utilized. Such results indicate ERAS protocols are successful and are likely to continue to expand (Kahokehr et al., 2009).

Methodology

The design of this project was aimed at introducing the key components and framework of a customized ERAS protocol. Objectives included researching current evidence-based literature to determine the effectiveness of ERAS implementation in open and laparoscopic colorectal procedures, developing a customized ERAS protocol, and introducing the pathway to members of anesthesia, pharmacy, and the perioperative team. An educational module was presented to increase knowledge and encourage protocol adoption. A PowerPoint presentation served as the educational module. The education focused on the key components of ERAS, projected benefits of adoption, and facility directed goals following implementation. The education was evidence-based with a primary focus on colorectal procedures.

The setting of this project was a rural hospital in southern Illinois. A non-experimental single group posttest was utilized to assess voluntary participants. Participants included in the

study were anesthesiologists, certified registered nurse anesthetists, pharmacists and registered nurses from any of the perioperative areas willing to attend the educational presentation and complete the posttest. The potential sample size was 25.

This project was deemed exempt by SIUE's Institutional Review Board (IRB). Following IRB, the project was verified and accepted by the host facility's research review board. Such actions were completed prior to the educational presentation which included the introduction of ERAS and its use in the colorectal surgical population.

Evaluation

The project evaluated the anesthesia staff and perioperative team's knowledge of ERAS management and core components. Following the educational module, the staff members were asked to fill out a posttest questionnaire. The presented questions were in true/false format and addressed protocol application, goals, key components, outcomes, and barriers to implementation. The questionnaire was collected following completion and analyzed to determine previous knowledge of ERAS and the effectiveness of the learning module. Overall, the project proceeded as planned with minimal unforeseen obstacles encountered. However, the timing of the presentation was prior to the start of the first OR cases and this limited the availability of the anesthesia staff. A resolution to this issue would be scheduling a separate presentation that would be convenient for those not previously available.

Impact on Practice

The purpose of this project was to introduce an enhanced recovery after surgery protocol for the management of colorectal procedures. Prior to the implementation, the majority of anesthesia providers and perioperative team members indicated minimal exposure to the components of ERAS and the diverse application of the protocol. Results of the study indicated

the educational module increased provider knowledge of ERAS and its application in the surgical arena. Additionally, staff members demonstrated a strong level of support for the adoption of the customized ERAS protocol. Currently, the rural hospital in southern Illinois is utilizing the protocol on a variety of patient populations and surgical procedures.

Conclusion

Patient care outcomes may be improved by further educating anesthesia providers and staff members about the utilization of the customized ERAS protocol. Evidence-based research has indicated the multidisciplinary approach of ERAS has frequently been implemented to modify the stress response to surgical stimulation (Gustafsson et al., 2012, Horosz, Nawrocka, & Malec-Milewska, 2016, Kahokehr, Sammour, Zargar-Shoshtar, Thomson, & Hill, 2009, Ralph & Duff, 2017). The result of compliance is a reduction in length of stay and overall complication rates across various surgical specialties (Delaney et al., 2007, Gustafsson et al., 2012, Horosz, Nawrocka, & Malec-Milewska, 2016, Nelson et al., 2016, Nicholson et al., 2014, Tan et al., 2015). Studies have further indicated improved clinical outcomes and significant reduction in resource expenditures. The results of this project revealed the surgical care team was in favor of the use of the customized ERAS protocol. Thus, adoption may have a significant impact on patient outcomes and anesthesia practice.

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