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EDITORIAL

Two unique studies highlighting the positive effects of enhanced recovery after surgery (ERAS) pathways on patient care and satisfaction

Dos estudios únicos en los que se destacan los efectos positivos de los protocolos ERAS (Recuperación rápida después de cirugía) para la atención y la satisfacción de los pacientes

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Enhanced recovery after surgery (ERAS) programs are clinical pathways designed to “fast-track” patients back to baseline health as quickly as possible after surgery. These perioperative plans were initially conceived by Kehlet¹, a surgeon in Europe. Kehlet and Mogensen² designed surgical interventions to improve patient outcomes in colorectal surgery. The central tenets of ERAS pathways include: minimal fasting time/early satiety, early ambulation, and multimodal analgesia.³ By employing these concepts, they were able to significantly decrease their surgical patient’s length of stay without increasing complications.² Since that time, ERAS programs have expanded to many countries and across other surgical subspecialties with similar results. Other interventions such as pre-operative surgical and anesthetic education, pre-habilitation, optimization of chronic medical conditions, minimizing bowel preparation/fasting times, carbohydrate loading, multimodal analgesia, nausea and vomiting prophylaxis, thromboembolism prophylaxis, standard antibiotics, standardized operative ventilation

strategies, goal-directed fluid therapy, early postoperative ingestion of clear fluids, and early ambulation have been incorporated into various ERAS pathways.⁴ Typical goals of these programs include decreased length of stay, decreased morbidity and mortality, and improved patient secondary outcomes.⁵ By reducing hospital stay and complications, hospital systems, and patients experience decreased overall costs.⁶ In this editorial, I will comment on 2 articles using ERAS pathways to show positive effects on patient care and satisfaction.

These 2 research articles, recently published in the *Colombian Journal of Anesthesiology*, examine patient satisfaction and outcomes in recently implemented ERAS pathways. In the first study, Aristizabal et al⁷ performed an observational retrospective study of patients undergoing hepatopancreatobiliary surgery before and after implementation of an ERAS protocol. They analyzed 364 patients and showed a decreased length of stay ($P < 0.001$) and lower mortality at 30 days ($P = 0.012$). The patients were divided into 2 groups: Group A was the pre-ERAS

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control group (surgery done between July 2012 and December 2014) and Group B, was the ERAS experimental group (surgery done between January 2015 and January 2017). All patients (independent of groups) were treated by the same surgical team, 2 hepatobiliary surgeons and 2 anesthesiologists. Group A patients were treated in the standard perioperative fashion, including 8 hours of fasting from both solids and liquids, no carb loading, no pre-op education. All patients underwent a general anesthetic while fluid and pain management strategies were left up to the anesthesiologists' discretion. Group B patients all had the newly implemented ERAS protocol applied to their surgical care. Interventions included nutritional evaluation, pre-habilitation, anesthetic, and surgical education, decreased fasting time to 2 hours for clear fluids and carbohydrate loading before surgery. Patients still underwent a general anesthetic but the volatile anesthetics, pain management, ventilation strategies, and goal-directed fluid therapy interventions were strictly dictated.⁷

Overall the results in Group B (ERAS group) were positive. They showed decreased risk of bleeding more than 600 mL, decreased need for transfusion, and decreased fluid administration of greater than 5000 mL. In addition, the hospital stay was shorter and 30-day mortality was lower in the ERAS group. Each outcome was statistically significant when compared to the pre-intervention group. In subgroup analysis, results were evaluated for hepatic surgery and pancreatic surgery separately. Here, some of the impressive outcomes seen in the large groups were absent. In pancreatic surgery, the ERAS intervention group maintained a statistically significant difference with decreased bleeding, fluids, and transfusions. Importantly hospital length of stay was also significantly less than standard therapy ($P < 0.001$). There was not a statistically significant decrease in mortality between the 2 groups ($P = 0.78$, $n = 3$ group A, $n = 4$ in group B). In the liver subgroup, again the differences in the pre and postintervention groups was decreased. Bleeding, reintervention, and length of stay remained statistically significant, while mortality, fluid therapy, and transfusion requirement showed no statistically significant difference. When procedures such as cholecystectomies, which did not directly involve the pancreas or liver, were removed from the sample population (negating 65 patients) mortality (and some other secondary endpoints) also lost their statistical significance.⁷

Aristizabal et al showed that by implementing an ERAS program they could decrease length of stay and complications frequently associated with hepatopancreatobiliary surgery. Even though the subgroup analysis was less remarkable for immediate intra and postoperative measures (probably because of decreased sample size in the subgroups), other important factors like length of stay, an indicator of hospital and patient costs, decreased in each cohort significantly after ERAS implementation.⁷

There are a few areas that represent important limitations of the study. First, in an ideally designed

study, the groups would be blindly assigned to either ERAS or non-ERAS over the same time period to remove assignment bias. However, the retrospective nature of the author's data precluded this type of design. There was no mention by the authors regarding the comorbidity differences between the 2 groups. Patients were assigned groups based on time of surgery. It is possible that there were significantly "sicker" patients and more complicated cases in 1 group as compared to the other. In addition, in designing the study this way, the surgeon and anesthesiologists experience over time could lead to better outcomes in later study patients (the experimental ERAS group). In the publication, although many of the interventions used were mentioned, it would have been useful for the authors to present their full ERAS protocol and provide data with how accurately each intervention was followed in the experimental population. This would lead more credence that their results were due to the interventions adopted in the ERAS protocol. Finally, as the authors alluded to, informational bias may be present in this study design.

The other ERAS-related publication in this edition of the *Colombian Journal of Anesthesiology* targeted patient's satisfaction, specifically those over 70 years of age. Olivares et al⁸ looked at 55 consecutive patients undergoing colorectal surgery with an implemented ERAS pathway. They aimed to measure the level of patient satisfaction with their ERAS pathway. The group used an ERAS, based on the ERAS guidelines and recommendations of the ERAS society, and implemented it as their standard clinical practice in 2016. They also developed a patient satisfaction survey and applied it to this study. The first 57 patients (2 were later excluded) to have elective, major, colorectal surgery with the newly implemented ERAS pathway were included in the study. Components of their pre-operative protocol included extensive anesthetic and surgical education, counseling against harmful lifestyle choices, nutritional optimization, and pre-habilitation. Due to staffing issues, the survey was administered by a blinded interviewer via phone call, 4 days after surgery. The survey was divided into 11 sections, rating surgical, anesthetic, and nursing qualities and is presented in the annex of their publication.⁸

The results of this study were promising. Eighty percent of the patients felt the information received before surgery by the surgeons and anesthesiologists was "very good", with no one rating it as average or less. Patients rated the treatment by physicians and nurses as "very well" 85.5% of the time, and only 3 patients had poor experiences (all with understaffed nurses). Importantly, 84.2% of patients rated their pain as equal to or less than 3. Survey participants did report that fluids were given somewhat or too early (52.8%) and ambulation was too soon or somewhat soon (58.2%) demonstrating the change in the care paradigm ERAS protocols bring. Overall, 96.4% of

patients were “very satisfied” with the care they received and every patient said they would undergo another procedure under an ERAS protocol and recommend it to a relative or friend.⁸

Patient satisfaction is often targeted as a goal of ERAS programs, but rarely evaluated. In general, the results of this study show patient satisfaction to be positive. As they state in their discussion, patient buy-in to ERAS pathways are vital to their implementation and ultimately their success. The survey demonstrated multiple areas of strong patient satisfaction scores, including education, competence, hospital care, discharge instruction, and others. The investigators recognized that pre-operative consultation with both anesthesia and surgery is extremely important for educating the patient and setting perioperative expectations. They spent approximately 45 minutes with each patient. This paid off with very high scores in the pre-operative consults and set up their patients to be successful, and satisfied, throughout the perioperative period. Finally, they noted that although through informed consent any patient could switch to conventional treatment from the ERAS pathway, none choose to do that (although 2 patients were withdrawn due to death while hospitalized).⁸

Although the study has some definite positive results in areas of compliance and patient satisfaction, there are also some areas of weakness. First, as the authors alluded to, there is no control group. The investigators did not survey patients under standard therapy either before or during ERAS implementation, so it is difficult to see the true impact of their survey results. In addition, the survey, while thorough, is not validated. Furthermore, the authors do not provide a justification regarding the choice of the domains included in the survey, again possibly weakening the results. It is interesting that the investigators chose to focus on only patients age 70 or greater. The authors never indicated exactly why they chose this population, nor if there were unique aspects of their pathway specifically for geriatric patients. It may have also been better to give the survey at various points throughout the hospital stay. Although an average pain score of 3 on hospital day 4 is favorable, these do change over time and it would have been useful to score pain immediately postoperatively, and trend that during their hospital stay. In their surgical data, they report the mean hospital stay to be 10.1 ± 3.9 days, which seems considerably longer than typical ERAS colorectal surgery stays in the United States. Anyway, the comparison is not facilitated by the descriptive statistics used by the investigators. Hospital length of stay is usually a very right-skewed, non-normally distributed variable, and for this reason it should be reported as median with interquartile ranges.

Another interesting aspect of this study was that patients were hesitant to adopt new postoperative plans, such as early ambulation and food intake. Although the

patients were counseled extensively, and there is good evidence to support these practices, the study shows that cultural shifts take time and considerable effort. This concept can likely be extended to the physicians as well. Although some have adapted to the mounting evidence and positive outcomes of ERAS protocols, there are still many who are hesitant to adapt. It is also worth noting that they included patient education level in the general data. Over 83% of their patients had elementary school or no education. This highlights the importance of spending enough time with the patients to ensure their understanding. These practitioners clearly did a nice job of educating their population and preparing educational material that was universal to patients of all education level. Finally, when assessing competence of staff, it was noted that they were some scores of “average” or “poor” in the nursing area. This may not only speak to the stress of nursing staffing shortages, but may also indicate an area where ERAS pathways can improve. Namely, better communication with our nursing colleagues may help improve the overall care of these patients.

In conclusion, we reviewed 2 unique studies that both highlighted positive effects of ERAS protocols on patient care and patient satisfaction. Aristizabal et al showed improved outcomes of patients undergoing hepatopancreatobiliary surgery by comparing outcomes pre and post-ERAS implementation. Olivares et al showed that patient satisfaction was extremely high when ERAS protocols were implemented for colorectal surgeries. Overall both articles continue to build on mounting evidence that ERAS pathways improve patient outcomes and satisfaction without increasing complications. Follow-up studies would certainly be useful to continue reinforcing these concepts to our colleagues and the medical community as a whole. Finally, both publications demonstrate that teamwork and collaboration between all stakeholders of patient care—surgeons, anesthesiologists, nurses, and even the patients themselves, are essential to having successful ERAS pathways and improving outcomes for all.

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