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Joseph Grazaitis

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Executive Summary

Introduction of the Problem

Enhanced recovery after surgery (ERAS) protocols have been designed and introduced across the Nation for patients undergoing colorectal surgery. The goal of the protocols are to decrease surgical complications, shorten the patients' hospital stay, and decrease patient recovery time back to their baseline (Aarts et al., 2011). ERAS protocols begin during the pre-operative phase and continue until the patient is discharged from the hospital. Major components of an ERAS protocol include: Pre-operative patient teaching, minimizing NPO status, oral bowel prep, and carbohydrate loading. Intra-operative interventions include: a mid-thoracic epidural block for 72 hours or bilateral trans-abdominal plane blocks, prevention of fluid overload, goal-directed fluid replacement for large surgical blood loss, no nasogastric tube, and the use of non-opioid medications for the treatment of pain. Post-operative care includes: early food intake post-operative day (POD) 1, early mobilization POD 1, and pain control with non-opioid medications (Ota et al., 2016).

Current and ongoing research on ERAS protocols focuses on manipulating and expanding specific variables with the goal of identifying which components of the protocol influence positive outcomes, and to see if even greater outcomes may still be achieved. The common outcome measures used to determine successful intervention include length of stay, readmission rates, post-operative complications, pain control, and quality of life. Due to the significantly positive outcomes with previous research examining ERAS protocols for colorectal

procedures, researchers are currently examining the benefits of using an ERAS protocol with non-colorectal procedures.

A 25-bed rural access hospital in central Illinois, congruent with many rural access hospitals, continues to practice using conventional methods for pre-operative, intra-operative, and post-operative care of patients' undergoing major colorectal surgery, even though all of the resources necessary to implement an ERAS protocol already exist within the facility. With research demonstrating significant improvements in patient outcomes when using an ERAS protocol as compared to conventional methods, a practice change was needed.

Literature Review

A thorough literature review was conducted. A synopsis of the findings is demonstrated in the following paragraphs. A systematic review showed a significant decrease in morbidity and total LOS when using ERAS (Spanjersberg, Sambecq, Bremers, Rosman, Laarhoven, 2014). These findings were further substantiated by Ota et al. (2016) and Aarts et al. (2011) showing a median decrease in LOS by 5.5 days for a total LOS of 5 days or less respectively. Yuen et al. (2015) showed no increase in complications or readmissions with early discharge. However, rectal cancer increased LOS by 1 day (Pedziwiatr et al., 2016).

The use of non-opioid pain control methods was reviewed. Pirrera et al. (2017) demonstrated that trans-abdominal plane (TAP) blocks were just as effective as thoracic epidurals (TEA) for post-operative pain control. According to Bhangu, Singh, Fitzgerald, Slessor, & Tekkis (2014) non-selective NSAIDS were found to have a strong association with anastomotic leaks, while selective NSAIDS did not increase anastomotic leaks. However, Saleh et al. (2014) could not find a statistically significant association with NSAID use and anastomotic leaks. The use of gabapentin and pregabalin for acute pain demonstrated a decrease

in morphine use up to 24 hours (Rai et al., 2017). However, Mao, Wu, & Ding (2016) showed a reduction in morphine use up to 48 hours. The Addition of intravenous lidocaine according to Vigneault, et al. (2010) demonstrated a decrease in opioid consumption, pain scores, and time until first bowel movement. The literature also demonstrated morphine reduction with the use of ketamine. According to Bicer, Eti, Saracoglu, Altun, & Gogus (2014) when ketamine is administered as a 0.5mg/kg bolus and continued as a medication drip at 0.25mg/kg/hr there is a statistically significant reduction in morphine consumption, however it was vital to continue the ketamine post-operatively. Jouguelet-Lacoste, Colla, Schilling, & Chelly (2015) substantiated these findings by analyzing 39 additional ketamine studies.

Project Methods

The purpose of this doctoral project was to create and implement an enhanced recovery after surgery protocol (ERAS) for a 25-bed critical access hospital. The project team and general surgeons collaborated and created the protocol that best suited the specific institution. The collaboration included all the departments involved with the care and recovery of the patients. The secondary goal was to examine the objective measures of interest, and clinical staff perceptions of the impact the ERAS protocol had patient care.

An ERAS protocol was created based on institutional goals, elements of other successful ERAS protocols, and key research findings from the literature review. The protocol created covers the entire perioperative course until the patient is discharged to home. After implementation the patients who underwent an elective colorectal procedure were automatically enrolled into the ERAS protocol. The patient's opioid consumption for pain control was monitored during the perioperative course. Additionally, each patient's total LOS was recorded. lastly, clinical staff who cared for patients who underwent a colorectal procedure with the ERAS

protocol were surveyed to examine the perception of the providers view of patient pain control, activity tolerance, and patient satisfaction.

On May 23rd, 2018 the Southern Illinois University Edwardsville IRB determined that this effort was considered a Quality Improvement Project (QIP) and did not constitute human subjects research as defined under 45CFR 46.102(1). Therefore, no further action was required prior to training implementation. Additionally, the critical access hospital administrative review board approved the project. Clinical staff and patients who chose to participate were provide the approved research participant notification before they begin. Patient identifiers were removed from all obtained patient data, and clinical staff who participated in the survey remained anonymous by placing their completed surveys privately in a designated folder in their respective department.

Evaluation

There were three patients who underwent elective colorectal procedures with the ERAS protocol. Two historical patients who underwent elective colorectal procedures prior to the use of an ERAS protocol were used as a reference to compare outcome measures. The three patients who underwent an elective colorectal procedure with the ERAS protocol averaged 7.5 mcg of sufentanil IV during the procedure and 5mcg of sufentanil and 0.15 mcg duramorph intrathecally. Average opioid consumption during the post-operative phase up to discharge was zero, and the average length of stay was 2.5 days. The two historical patients examined prior to the use of an ERAS protocol averaged 50mcg of sufentanil intraoperatively and 0.15mcg duramorph intrathecally. Each historical patient had post-operative morphine patient controlled analgesic pumps with basil drip rates of 1mg/hr with programmed boluses. The exact amount of total morphine was not obtainable through medical records. The average length of stay was 8.5

days for the non-ERAS patients. The findings indicate a positive trend toward decreased length of stay and lower opioid consumption compared with the non-ERAS patients.

The blinded survey of clinical staff was completed by seven clinical staff members. The results of the survey demonstrated that 100% of the providers perceived patients had a better recovery, better pain control, improved activity tolerance, and an increased patient satisfaction. Limitations of this project are relative to the low numbers of procedures at this critical access hospital. However, institutional outcome measures were compared with national post-ERAS implementation data. The findings showed that this institution had length of stays less than 5 days and a decreased in opioid use. This indicates that this institution met or exceeded the national outcome-measure data.

Impact on Practice

The results of this project demonstrate that ERAS protocols can be successfully implemented in a critical access hospital. The findings seem to indicate a positive trend toward decreased length of stay and lower opioid consumption. The survey of clinical staff suggested that providers perceived patients had a better recovery, better pain control, improved activity tolerance, and increased patient satisfaction. Limitations of this project are relative to the low numbers of procedures at this critical access hospital. However, institutional outcome measures were compared with national post-ERAS implementation data. The findings showed that this institution met or exceeded the national outcome-measure data. Long-term outcomes should continue to demonstrate a decreased LOS, a decrease in complications, and an increase in patient satisfaction.

Conclusion

This practice protocol met the goals of the project. The first goal was to develop an ERAS protocol for a critical access hospital while incorporating evidenced-based-practice guidelines from the literature review. The second goal was to see a positive trend towards a decreased length of stay and lower opioid consumption. The third goal was that providers would perceive better pain control, better recovery, improved activity tolerance, and an increase in patient satisfaction. The final goal was for this institutions' outcomes were to meet or exceed national ERAS data. The projects outcomes seem to support that an ERAS protocol can be successfully implemented at a critical access hospital. The initial outcomes indicate that a clinically relevant change occurred with implementation.

Author Contact Information

jgrazai@siue.edu

crna8987@gmail.com