

Enhanced recovery to improve outcomes in pancreaticoduodenectomy

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Background

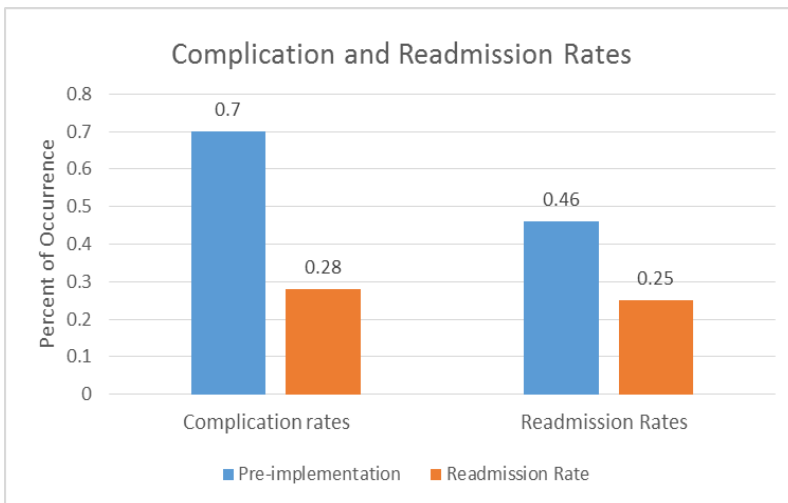
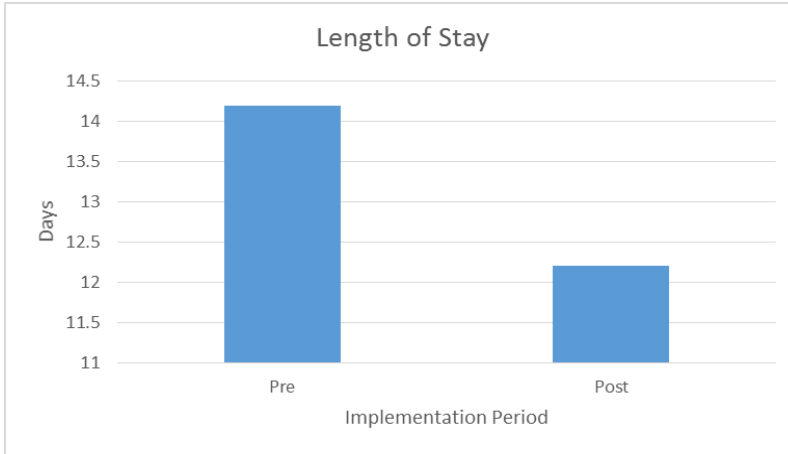
Enhanced recovery programs (ERPs) have been applied to a multitude of surgical procedures in an effort to enhance care by reducing postoperative complications, decreasing hospital length of stay, reducing readmission rates, improving patient outcomes, and enhancing patient experience. ERPs are multimodal and involve defined preoperative, intraoperative, and postoperative elements that when collectively applied improve clinical outcomes. Pancreaticoduodenectomy, otherwise known as the Whipple Operation, is a complex, costly procedure performed for pancreatic cancer and chronic pancreatitis. Typically, the operation involves resection of the pancreatic head, distal stomach, duodenum, bile duct and gallbladder, and is associated with high post surgical morbidity rates.

Methods

The quality improvement project included 56 adult patients undergoing pancreaticoduodenectomy due to either a pancreatic carcinoma or life-altering chronic pancreatitis. A team was developed for the project. Our ERP was developed based on existing evidence-based pathways and reviewed by the team's surgeon and anesthesiologist. Education was provided to all anesthesia care providers and printed pathways were placed within the operating rooms. All adult patients scheduled to have pancreaticoduodenectomy received two 355ml carbohydrate drinks that contained 50g of carbohydrates, 3 g L-citrulline, and maltodextrin. The patients were instructed to drink one bottle the night before surgery and the second three hours prior to surgery. Patients were educated on the benefits of the carbohydrate-rich drink by the clinical educator during their preadmission testing appointment. Intraoperative goal directed fluid therapy was achieved using a modified Ramsingh protocol during all open phases of surgery. During the laparoscopic portions, fluid optimization was per the NHS NICE protocol. All patients also attended a preoperative class where they were educated on preoperative nutrition, exercise, smoking cessation, alcohol cessation, early mobilization, postoperative pain medication, and postoperative nutrition

Results

Overall, outcomes improved following implementation of our ERP. Prior to implementation, our overall complication rate associated with pancreaticoduodenectomy was 70%. Following ERP implementation, our complication rate decreased to 46%. The most prevalent complications included delayed gastric emptying (DGE) nausea, respiratory insufficiency, SSI, and wound dehiscence. Prior to this quality improvement project, the two most prevalent complications were DGE and SSI (53% and 40%, respectively). Following implementation of the ERP, our DGE rates decreased to 47% and SSI to 12%. This improvement was reflected in readmission rates. Prior to this implementation, our 30-day readmission rate for this procedure was 28%. This was decreased to 25% following implementation. Lengths of stay decreased by 14.02% following the ERAS pathway implementation, from 14.19 days to 12.2 days.



Conclusions

Pancreatic surgery is associated with poor survival rates. Outcomes research involving Enhanced Recovery in pancreaticoduodenectomy is lacking, however, ERAS guidelines for patients undergoing pancreaticoduodenectomy exist. Although the literature and this quality improvement project supports the use of an Enhanced Recovery pathway in patients undergoing pancreaticoduodenectomy, appropriately powered randomized controlled trials will be needed to prove the benefit of ERPs in this surgical population.