Intrathecal Narcotics Provide Optimal Pain Management In An Enhanced Recovery Pathway for Colorectal Surgery

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INTRO: Enhanced recovery (ER) pathways are a complex bundle of pre-, intra- and postoperative interventions focused on improving patient safety and satisfaction while reducing complications and costs. [1] While ER pathways are effective, the overall impact of intraoperative pain management interventions on success is unknown. In this quality improvement project we evaluated differences in intraoperative pain management techniques on postoperative pain and length of stay.

METHODS: IRB approval was obtained for this retrospective analysis of a database as a quality-improvement initiative. We retrospectively evaluated all elective colorectal ER cases after the introduction of a robust standardized ERP that included vigorous preoperative, intraoperative and postoperative management. [1] Adjunctive multi-modal pain medications (acetaminophen, celecoxib, gabapentin, ibuprofen and IV toradol) were scheduled by protocol. However, we allowed variation for 3 different intraoperative pain management regimens - 100 mcg intrathecal dilaudid (G1), 30 ml liposomal bupivacaine wound infiltration at the end of the procedure (G2), or standard IV narcotic therapy (G3). Medication administration, pain scores, and discharge times were obtained from the electronic health record. Oral morphine equivalents were calculated based on standard conversion factors.[2]

STATISTICS: Statistical analyses were performed using SigmaStat for Windows. Results are expressed as mean (SD), percentages, or median with 25th and 75th percentiles. Normally distributed data were compared using one way ANOVA and when appropriate a post hoc Tukey HSD to correct for multiple comparisons. Data that were not normally distributed were compared using a Kruskal Wallis test with Dunn's method for unequal sample sizes to correct for multiple comparisons. Categorical data were compared by χ2 test, and the results were expressed in percentages. For all of the statistics regarding study measures, a p < 0.05 was chosen as the threshold for determining significance.

RESULTS: 234 colorectal ERP surgeries were included (n, G1=33, G2=82, G3=119). The distribution of laparoscopic cases was similar (G1 81%, G2 63%, G3 75%, p>0.05). Patient characteristics were similar (age, weight, ASA classification, gender, p>0.05). Multi-modal analgesics (MMA) were scheduled as the primary pain therapy and there were no differences in the use of MMA (acetaminophen, celecoxib, gabapentin, ibuprofen, and IV ketorolac, p>0.05)). Intraoperative and postoperative fluids were similar in each group (TABLE 1: p>0.05) and there were no differences in length of stay between groups. The major differences were recorded pain scores and postoperative oral morphine equivalent (ME) consumption (TABLE 2). Pain scores were significantly lower (p<0.01) on the day of surgery (DOS) and POD1 in G1 versus G2 and G3. ME
consumption was also significantly lower on the DOS through POD 2 in G1 compared to the other groups. While the ME consumption in G2 (liposomal bupivacaine infiltration) significantly lower compared to the narcotic group on the DOS this effect was not present on POD1 or 2 and was not represented in the total ME consumption from surgery through POD2. The majority of patients were discharged on POD 2 in this evaluation (G1, 81%, G2, 75%, G3 80%, p>0.05).

LIMITATIONS: Quasi-experimental performance improvement projects always have internal validity concerns that need to be addressed. In this project, historical and maturation threats appear to be negligible since no other changes occurred in the ER pathway compliance or methods of EHR documentation during the time frame of analysis and the distribution of patients in the groups did not change over the time of analysis.

DISCUSSION: There were three notable findings in this quality improvement project. First, overall pain management with scheduled MMA provided exceptional pain relief in all groups (low average pain scores in each group). Second, scheduled multi-modal analgesia in conjunction with IT dilaudid provided the best pain therapy as indicated by pain scores on DOS and POD1 and lower narcotic consumption throughout the hospital stay. This finding is consistent with efficacy of intrathecal narcotics in other enhanced recovery implementation projects. [3,4] The second important finding in this project was that incisional liposomal bupivacaine with MMA was only slightly better than standard narcotics with MMA therapies on the DOS but these differences did no translate to significant reduction in ME during the hospitalization. While liposomal bupivacaine has been reported as having efficacy in TAP blocks [5], no previous reports have evaluated incisional administration in ER pathways.

CONCLUSION: Despite the differences in pains scores and ME in the intrathecal group, overall pain management and N/V control was adequate in each group to continue with protocol compliance for urinary catheter and IV discontinuation, rapid ambulation and diet advancement and subsequently no change in the major outcome goal in an ERP pathway - time to discharge. The impact of decreasing pain and narcotic medication management on nursing personnel workflow, time management and satisfaction was not evaluated.

REFERENCES:


