The Impact of Preoperative Long Acting Oxycodone on Postoperative Opioid Use, Pain, and Recovery Time in Multi-level Spine Surgeries

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Background

Ineffective postoperative pain management is associated with poor patient satisfaction, delayed recovery and may result in permanent psychological distress and post traumatic stress disorder [1-3]. As federal and private payers advocate for shorter hospitalizations, providers are incentivized to facilitate enhanced recovery after surgery. Preoperative multimodal analgesia (MMA) regimens have been associated with reduced postoperative narcotic use, decreased pain scores and more rapid recovery after operation. In a previous study, members of our team demonstrated a preoperative MMA regimen of gabapentin and celecoxib was effective at reducing 24 hour post-operative opioid use, pain scores, and length of stay [4]. We sought to build on this knowledge and study the impact of addition of preoperative oxycodone ER to a MMA regimen of intravenous acetaminophen, oral gabapentin, or non steroidal anti-inflammatory (celecoxib) to determine if it would result in greater pain relief and improved outcomes. In addition, we wished to evaluate the *safety* and potential adverse effects on respiration *(apnea)* that might occur in the first 24 hours after operation.

"How can we reduce postoperative patient pain, opioid use, and time to recovery?"

Objectives

Our aim was to compare the differences in outcome between similarly matched groups of patients who received a long acting narcotic containing MMA protocol to a cohort receiving matched drug therapy as described above without a long acting narcotic. Objective measures studied included postoperative narcotic consumption, visual analog pain scores (VAS), time to full mobility, length of stay (LOS), length of post anesthesia care unit (PACU) stay, and frequency of administration of naloxone, ondansetron, and metoclopramide.

"Will including long acting narcotic as part of preoperative pain regimen reduce postoperative pain, opioid use, and recovery time?"

Methods

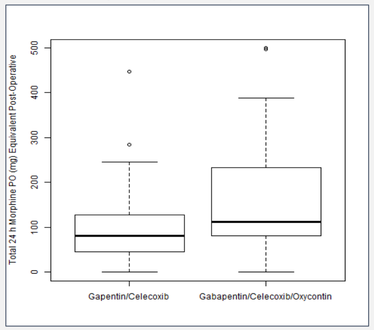
Retrospective study conducted in two parts. In the first part, spine surgery patients who underwent multilevel procedures and who received preoperative oxycodone ER alone or with any combination of gabapentin, acetaminophen, and celecoxib were included as protocol group (n=178.) Spine patients who received any of those without oxycodone ER or none were control (n=178.) Total opioid medication intake for the first 24 hours after surgery was determined and converted to total morphine equivalent. VAS pain perception scores were averaged over the first 24 hours after surgery. Total time in PACU, and administration of naloxone, ondansetron, or metoclopramide were extracted from EMR. POD to mobility and discharge were determined from PT chart notes. For the second part, the same methods and outcomes were used but protocol group were those who received oxycodone ER, gabapentin, and celecoxib as part of preoperative MMA (n=80.) Control received gabapentin and celecoxib preoperatively (n=53.) For both parts, all outcome measures were adjusted for number of spine levels instrumented and patient BMI.

Results

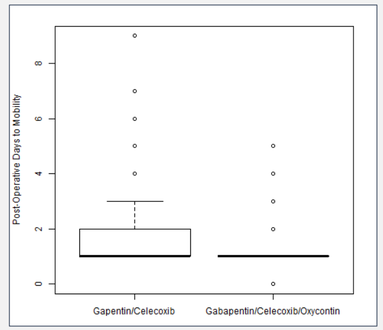
First part of study: mean 24-hour postoperative morphine equivalent consumption in the protocol group was significantly higher than control group (181.6 ±160.4 vs 138.9 ±178.1, P=0.007). Frequency of ondansetron administration was significantly higher in control group compared to protocol group with odds ratio 0.57 (95% CI 0.36, 0.92) (P=0.021). Second part: mean 24-hour postoperative morphine equivalent consumption was significantly higher (150.7±105.8 vs 100 ±80.3, P=0.030) in protocol group. Protocol group demonstrated significantly lower mean length of stay (3.2±2.3 vs 4±2.3, P=0.019), POD to mobility (1.2±0.8 vs 2±1.7, P=0.004), and POD to cleared from PT (2.7±1.8 vs 3.7±2.3, P=0.004), compared to control.

"Is including long acting narcotic as part of preoperative analgesia regimen more effective than matched control?"

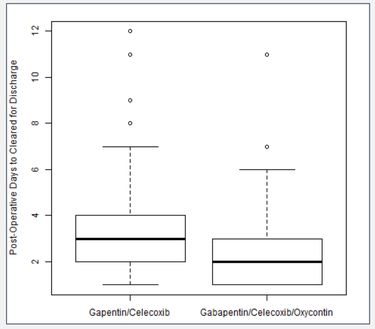
24 hr post operative opioid use



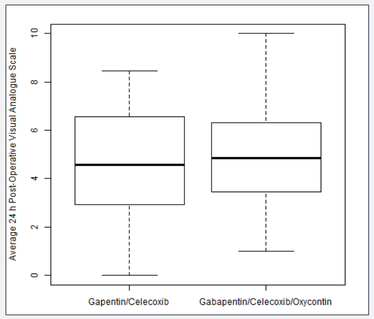
POD to mobility



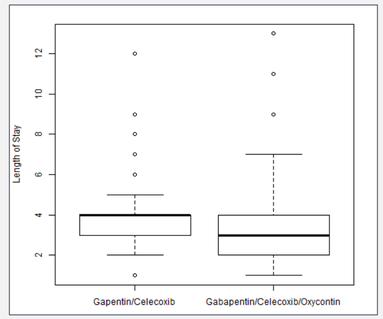
POD to clear for discharge from PT



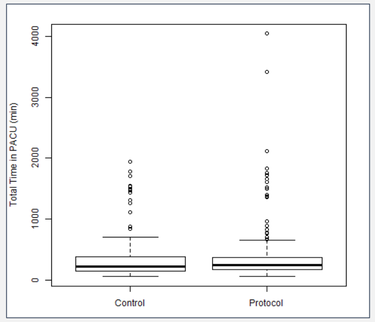
24 hr postoperative VAS pain score



Average Length of Stay



Time in PACU



Naloxone Use (n, %)	Gabapentin/Celecoxib (n = 53)	Gabapentin/Celecoxib/Oxycodone ER (n = 80)
No	52 (98.1%)	80 (100%)
Yes	1 (1.9%)	0
Metoclopramide Use (n, %)		
No	50 (94.3%)	77 (96.2%)
Yes	3 (5.7%)	3 (3.8%)
Odds ratio (95%CI)	0.57 (0.10, 4.83)	P value 0.504
Ondansetron Use (n, %)		
No	38 (71.7%)	61 (76.2%)
Yes	15 (28.3%)	19 (23.8%)
Odds ratio (95%CI)	0.84 (0.38, 1.92)	P value 0.678

Conclusions

Results suggest preoperative long acting narcotic as part of MMA is not supported based on increased 24-hour postoperative opioid use, but is as safe as control based on similar rates of naloxone and metoclopramide administration, and decreased ondansetron use. Long acting narcotic administered with gabapentin and celecoxib may increase postoperative opioid use, but expedite patient recovery based on decreased length of stay and faster mobilization and discharge from PT. Larger study using preoperative oxycodone ER as part of MMA is warranted.

Preoperative multimodal analgesia of gabapentin, celecoxib, and oxycodone ER:

- Increased 24 hr post operative opioid use compared to control
- Similar in postoperative pain and safety compared to control
- May expedite patient recovery and discharge

References

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