Intravenous versus Oral Administration of Acetaminophen Perioperative to Instrumented Lumbar Fusion: A Single Center, Randomized Control Trial

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INTRODUCTION:
In an effort to reduce opioid consumption, physicians have looked toward alternative options for pain relief for surgical patients. Opioid alternatives have been shown to be effective while also decreasing the risk of side effects such as constipation, nausea, and addiction. One such alternative is IV acetaminophen, which has been shown to successfully reduce the risk of such side effects, however at a relatively high cost. Testing the effectiveness of IV acetaminophen may address questions about the cost-effectiveness of this promising opioid alternative. Our goal is to prospectively evaluate clinical outcomes of IV versus oral (PO) acetaminophen following circumferential lumbar fusion. We hypothesize that IV acetaminophen will reduce length of hospital stay, analgesic morphine equivalent consumption, and pain levels, and will do so more effectively than PO acetaminophen.
METHODS:
In this prospective, single center, randomized control trial, patients were screened to meet the inclusion/exclusion criteria. One hundred patients (50 per group) between the age of 18-85 undergoing circumferential lumbar fusion surgery were included in the study. Patients with prior surgery or fracture at the index level(s), significantly elevated surgical risk, a history of drug abuse, and/or inability to take orally administered acetaminophen were excluded from this study. Enrolled patients were randomized into either IV or PO groups. Preoperative baseline surveys were collected. The first dose of the assigned acetaminophen was administered within 3 hours prior to surgery. Postoperatively, 7 additional doses were given every 6 hours. Patients had access to supplemental opioid analgesics as needed. Analgesic consumption and visual analog pain scale (VAS) scores were recorded daily until discharge. Patients were followed at 6 week and 6 month postoperatively and administered questionnaires. Pain medication usage was recorded.
RESULTS:
Daily morphine equivalent (MME) consumption was statistically significantly lower for the IV group than the PO group ($p = 0.001$) from postoperative to final administration of acetaminophen dosage. Post regimen average daily MME was also statistically significantly lower for IV group than PO group ($p = 0.002$). Average length of stay was similar between groups. The IV group showed greater reduction in VAS and ODI between baseline and discharge. However, VAS Back and VAS Leg scores were similar for both groups out to 6 months postop, but both groups showed statistically significant differences from baseline in frequency and intensity. ODI was also statistically lower than baseline in both groups out to 6 months.
DISCUSSION AND CONCLUSION:
In addition to an overall reduction in opioid use, patient surveys indicate an improvement of pain management with the use of IV acetaminophen. Our findings suggest that IV acetaminophen is a safe and effective alternative to opioid use. The decrease in risk of side effects makes IV acetaminophen a promising alternative to opioid use, despite the added cost.