



Research Week 2021

Collaborative multi-modal pathway reduces opioid consumption after total hip and knee arthroplasty

Ryland Kagan, M.D., Leah Esposito, B.A., Jessica Foerster, B.S., Mahmoud Kellah, B.S., Megan Rushkin MPH

espositl@ohsu.edu
OHSU School of Medicine

Keywords

Total Joint Arthroplasty, Opioids, Post-op Pain Management

Abstract

Intro

Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are two of the most prevalent procedures performed on the aging population. The invasive nature of these procedures is associated with a substantial amount of post op opiate consumption. In order to reduce opioid consumption in this patient population, a multimodal pain control pathway (MP) was created at OHSU using input from pharmacy, nursing and surgery. The aim of this study is to evaluate the effectiveness of this pain control pathway in reducing post-operative opioid consumption.

Methods

A retrospective cohort study was undertaken at a single academic institution that involved 433 patients who were receiving primary TKA or THA from one of three adult reconstruction surgeons between Jan 2017 and March 2020. The multimodal pathway was implemented in November 2019. Data was collected from 249 patients receiving previous standard of care (SOC) and 206 patients enrolled in the MP. The primary outcome measured was morphine milligram equivalents (MME) consumed in the first 24 hours post-operatively. Secondary outcomes included pre and post-operative pain scores, total MME provided at discharge and total prescribed within the first 6 weeks following discharge. Two patients were excluded from the study due to inability to accurately record MME from the medical record. Basic patient demographics and co-morbidities were included in data collection. Chi square and Fisher exact tests were used for categorical variables, and independent sample t-tests and Mann Whitney tests were used for continuous variables. Multivariable quantile regression was also done to compare amount of MME consumed per 24 hrs post-operatively and prescribed at discharge between the SOC and MP patients. Significance was set at $p < 0.05$.

Results

Despite having similar average postoperative pain scores of 4.7 in the SOC group and 4.5 in the MP group, the MP group consistently consumed less MME on average than the SOC group. Post-operative MME average per 24hrs inpatient was 84.7 (50.4, 139.6) for SOC and 57 (30.5, 94.3) for MP ($p < 0.001$). Average total MME prescribed at discharge was 525 (400, 750) for SOC and 300 (225, 450) for MP ($p < 0.001$). Average total MME prescribed in the first 6 weeks following discharge was 400 (0, 1050) for SOC and 150 (0, 590.6) for MP ($p = 0.01$). Multivariable adjusted quantile regression analysis revealed significantly lower levels of postoperative MME consumption per 24 hours in the 0.25, 0.50, 0.75, and 0.90 quantiles in the MP group. These differences ranged from 24.1% at the 0.90 quantile to 38.6% at the 0.25 quantile. It also showed significantly lower levels of MME prescribed at discharge across all quantiles. These differences ranged from 35.6% at the 0.75 quantile to 43.9% at the 0.25 quantile. Average length of stay was also reduced in the MP group compared to the SOC group ($p = 0.01$).

Conclusion

Our collaborative multimodal pathway has been shown to reduce post-operative opioid consumption in patients undergoing TKA and THA with no increase in length of stay or pain scores. Future directions should include studies implicating this approach in other patient populations that require opioid analgesic control.