

Patient and Treatment Factors Associated with Opioid Usage After Tibial Shaft Fracture Fixation

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Purpose: Opioids are often a part of multimodal pain management after operative treatment of tibial shaft fractures. To date, there is no established baseline for narcotic consumption after operative fixation of tibial shaft fractures. This study sought to establish a baseline of inpatient oral morphine equivalents (OMEs) for these injuries and identify factors that influence rates of consumption. Our hypothesis was that younger patients, male sex, and lack of local regional anesthesia (LRA) would be associated with higher inpatient opioid consumption.

Methods: All patients undergoing tibial shaft fracture fixation (CPT codes 27758 or 27759) at a single, Level-I, academic medical center between July 1,2013, and July 1, 2018, were identified (n = 491). Age, sex, race, body mass index (BMI), smoking status, Charlson-Deyo comorbidity score, LRA usage, and prevalent comorbidities were incorporated into multivariable linear regression models of inpatient OME consumption.

Results: Patients consumed a mean (standard deviation) of 40.5 (31.4) OMEs per 24-hour period after surgery. Younger age (P <0.001), male sex (P = 0.007), increased BMI (P = 0.012), smoking (P <0.001), lack of LRA usage (P = 0.019), and psychiatric diseases such as depression and psychosis (P = 0.020) were associated with increased opioid consumption in multivariable models. LRA usage was associated with the largest reduction in opioid consumption (13.3 OMEs/day) while smoking was associated with the greatest increase in opioid consumption (16.3 OMEs/day).

Conclusion: This study is the first to establish a baseline of inpatient opioid consumption for operatively treated tibial shaft fractures and to identify factors associated with increased usage. Younger age, male sex, increased BMI, smoking, lack of LRA usage, and psychiatric diseases were associated with increased narcotic consumption. Smoking and lack of LRA usage had the largest impact on OME usage. This study is a pivotal step in the effort to predict and reduce narcotic consumption after tibial shaft fractures.

Table 1: Patient and treatment factors associated with opioid usage per day from date of surgery to discharge. Individual comorbidities were tested in multivariable models that incorporated age, sex, race, BMI, smoking, Charlson-Deyo comorbidity subscore, and LRA. P-values less than 0.05 in multivariable models were considered significantly associated with the outcome.

Patient and treatment factors	Mean (SD) or proportion (%)	Mean adjusted additional OME's (95% CI, p-value)
Opioid consumption (OME's)	40.5 (31.4)	n/a
Age (years)	43.7 (19.3)	-0.3 / unit (-0.5, -0.1; <0.001)
Female sex	175 / 491 (35.6%)	-8 (-13.8, -2.2; 0.007)
Caucasian race	244 / 491 (49.7%)	4 (-1.5, 9.5; 0.152)
BMI (kg/m2)	28.5 (7.1)	0.5 / unit (0.1, 0.9; 0.012)
Current smoker	121 / 488 (24.8%)	16.3 (9.8, 22.8; <0.001)
Charlson-Deyo comorbidity sub-score	1.1 (2.3)	-0.3 / unit (-1.6, 1; 0.66)
Local regional anesthesia	30 / 491 (6.1%)	-13.3 (-24.3, -2.2; 0.019)
Hypertension	107 / 491 (21.8%)	-1.3 (-9.9, 7.4; 0.77)
Depression or psychosis	102 / 491 (20.8%)	8.6 (1.3, 15.8; 0.02)
Cardiac arrhythmia	94 / 491 (19.1%)	-2 (-9.5, 5.5; 0.61)
Depression	92 / 491 (18.7%)	7.3 (-0.3, 14.9; 0.061)
Fluid and electrolyte disorders	83 / 491 (16.9%)	-1.8 (-10.6, 7; 0.69)
Chronic obstructive pulmonary disease	65 / 491 (13.2%)	6.5 (-2.4, 15.5; 0.151)
Diabetes mellitus	62 / 491 (12.6%)	2.3 (-7.6, 12.3; 0.65)
Deficiency anemia	62 / 491 (12.6%)	0.1 (-9.7, 9.8; 0.99)
Obesity	58 / 491 (11.8%)	3.1 (-6.6, 12.8; 0.53)
Peripheral vascular disease	51 / 491 (10.4%)	-9.4 (-20.5, 1.6; 0.094)
Drug abuse	49 / 491 (10%)	3.8 (-5.6, 13.3; 0.43)
Alcohol abuse	46 / 491 (9.4%)	9.4 (-0.2, 19; 0.056)

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.

POSTER ABSTRACTS