Association Between Opioid Intake and Disability After Operative Treatment of Ankle Fractures

Abigail Finger, BA; Teun Teunis, MD; Michiel Hageman, MD; Emily Thornton, BS; Malcolm Smith, MD; ***David Ring, MD, PhD;***
Massachusetts General Hospital, Boston, Massachusetts, USA

Background/Purpose: The opioid-centric pain management strategies in the United States have contributed to an epidemic of prescription opioid abuse that is the most common cause of death of young adults. A prospective cohort study documented comparable pain intensity and satisfaction with pain relief after open reduction and internal fixation (ORIF) of an ankle fracture among patients using acetaminophen in the Netherlands and oxycodone in the United States. Another prospective cohort study found that increased inpatient opioid intake after operative fracture treatment was associated with more pain and decreased satisfaction with pain relief independent of the type, number, and severity of fractures. The effective coping strategy of self-efficacy was associated with less pain and greater satisfaction with pain relief after fracture surgery. In yet another prospective cohort study, opioid intake 1 to 2 months after fracture surgery correlated with psychological distress (PTSD [posttraumatic stress disorder], symptoms of depression). Studies consistently identify psychosocial factors as more strongly associated with symptom intensity and magnitude of disability after injury. Continuing this line of research, this prospective cohort study addressed the null hypothesis that disability (Foot and Ankle Disability Measure) at suture removal does not correlate with opioid intake, measured by oral morphine equivalents following ankle fracture surgery, accounting for demographics, trauma and surgery factors, treatment satisfaction, and psychological measures. Secondarily we assessed disability at 5 to 8 months after surgery and treatment satisfaction.

Methods: Following institutional review board approval, we prospectively enrolled 102 adult patients at suture removal after ankle fracture surgery, no more than 4 weeks after injury. We recorded patient demographics, opioid use before injury, oral morphine equivalents taken between discharge and suture removal, injury mechanism, Pain Anxiety Symptoms Scale, Pain Catastrophizing Scale, symptoms of depression (Patient Health Questionnaire-2), 11-point ordinal rating scales for active and resting pain intensity and for satisfaction with pain management and overall treatment, and foot and ankle-specific disability (Foot and Ankle Disability Measure). To address our secondary study questions 59 patients (60%) completed questionnaires 5 to 8 months after surgery.

Results: Accounting for interaction between variables using multivariable analysis there was no association of taking opioid medication and disability at the time of suture removal. Being married (β regression coefficient [β] 13, 95% confidence interval [CI] 4.2 to 21, P = 0.003; partial R2 0.087), sports injuries (β 15, 95% CI 4.7 to 26, P = 0.005; partial R2 0.080), and less pain catastrophizing (β -1.2, 95% CI -1.7 to -0.72, P <0.001; partial R2 0.20) were associated with less disability at the time of suture removal. Among the 60% of patients evaluated 5 to 8 months after surgery, greater disability was independently associated with more pain anxiety (β -1.1, 95% CI -1.7 to -0.48, P = 0.001; partial R2 0.19). Greater treatment satisfaction at suture removal was independently associated with less pain catastrophizing (β-0.088, 95% CI -0.12 to -0.053, P <0.001; partial R2 0.21). Five to eight months after surgery,

See pages 47 - 108 for financial disclosure information.

no variables were associated with treatment satisfaction. Additionally, greater pain at rest at suture removal was associated with more oral morphine equivalents at suture removal (β 0.042, 95% CI 0.0021 to 0.063, P <0.001; partial R2 0.14) and greater pain with activity at suture removal was associated with more oral morphine equivalents at suture removal (β 0.048, 95% CI 0.024 to 0.072, P <0.001; partial R2 0.14).

Conclusion: Opioid use and injury characteristics were not independently associated with disability or treatment satisfaction in patients recovering from ankle fracture surgery. Managing psychological distress and optimizing coping strategies are consistently identified as the best opportunities for decreasing symptom intensity and magnitude of disability during recovery from musculoskeletal trauma. It's time to move away from the opioid-centric model for pain management and proactively address stress, distress, and ineffective coping strategies.