Persistent Opioid Usage following Hip Fracture Surgery in Opioid-Naive Older Patient

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INTRODUCTION:
Over the past few decades, the United States has witnessed a disturbing rise in prescription opioid use, which has been accompanied by heightened levels of addiction, drug abuse, and overdose death. Recently, attention has focused on the degree to which the prescription of opioid pain medications by physicians could be contributing to this opioid epidemic. While the risk of long-term dependence following the opioid treatment of musculoskeletal injury has been widely studied in younger populations, most studies of opioids in older patients have centered on short-term risks such as oversedation and delirium. The purpose of this study was to assess the prevalence of, and risk factors for, prolonged opioid usage following hip fracture in opioid-naive older individuals.

METHODS: This was a retrospective cohort study of patients aged ≥60 who underwent surgical treatment of a hip fracture between 2009 and 2018 at one of 35 hospitals owned by a large US health maintenance organization. Patients who filled an outpatient opioid prescription in the 3 months prior to the hip fracture surgery were excluded, as were patients with cancer or cancer-related pain, pathologic fracture, prior surgery or infection in the affected hip, or bilateral hip fracture. Postsurgery outpatient opioid use was identified using the organization's integrated electronic health record and evaluated in the following time periods: P1 (day 0-30 post-surgery), P2 (day 31-90), and P3 (day 91-180). The primary outcome measure was persistent outpatient opioid use, which was defined as having one or more opioid prescriptions dispensed in all three of the above time periods (P1, P2 and P3). Multivariable logistic regression was performed with all models adjusted for potential confounders including age, sex, race/ethnicity, annual income, American Society of Anesthesiologists (ASA) classification, body mass index (BMI), medical comorbidities, opioid and chronic pain-related comorbidities, smoking status, preoperative non-steroidal anti-inflammatory drug (NSAID) use, procedure type, and type of anesthesia.

RESULTS: There were 29,618 opioid-naïve patients aged 60 and over who underwent surgical treatment of a hip fracture during the study period (median age 82, 70.7% female). Of those patients who were alive during the time period in question, the proportion of outpatient opioid usage was 83.7% (24,776/29,618) in P1, 69.0% (19,380/28,068) in P2, and 16.7% (4435/26,481) in P3. In the multivariable analysis controlling for confounders, risk factors for persistent opioid usage included young age (60-69), female sex, BMI≥30, current/former smoking, ASA classification≥3 and a history of substance abuse. Persistent opioid usage was less commonly observed among patients who were Asian, had an annual income of $150,000 or greater, or had undergone regional anesthesia. With regard to surgery type, persistent opioid usage was more common following fracture fixation and less common following total hip arthroplasty (both compared to hemiarthroplasty; see Table).

DISCUSSION AND CONCLUSION: In this study, 1 out of every 6 elderly hip fracture patients was still taking opioid pain medications at 3-6 months postoperative. While prior research on the hazards of opioids in the elderly has primarily focused on short-term risks such as oversedation and delirium, these results suggest that addiction and chronic opioid use may represent risks for this older population as well.

Table: Risk factors for persistent opioid usage following hip fracture surgery (N=26,481)

Characteristic	Crude incidence of persistent opioid use	Multivariable Odds Ratio (95% CI)	P
Age			
60-69	19.2% (687/3574)	**1.24 (1.11-1.38)**	**<0.0001**
70-79	17.6% (1200/6818)	1.05 (0.97-1.14)	0.24
80-89*	16.3% (1846/11,346)	1.00	---
90 or older	14.8% (702/4743)	0.94 (0.86-1.04)	0.24
Sex			
Female	17.3% (3286/19,053)	**1.24 (1.14-1.34)**	**<0.0001**
Male*	15.5% (1149/7428)	1.00	---
Race/ethnicity**			
Asian	10.9% (252/2307)	**0.66 (0.57-0.76)**	**<0.0001**
Black	19.7% (213/1083)	1.10 (0.93-1.29)	0.27
Hispanic	16.8% (423/2521)	0.91 (0.81-1.02)	0.10
White*	17.2% (3510/20,366)	1.00	---
Income			
Less than $25,000	17.6% (740/4212)	1.04 (0.65-1.68)	0.86
$25,000-$49,999	17.6% (906/5154)	1.53 (0.86-2.73)	0.15
$50,000-$74,999*	17.3% (777/4487)	1.00	---
$75,000-149,999	16.6% (1337/8059)	1.25 (0.77-2.02)	0.37
$150,000 or more	15.0% (669/4457)	**0.56 (0.37-0.83)**	**0.004**
Body mass index			
Less than 22	15.6% (1466/9411)	1.02 (0.93-1.11)	0.70
22-24.9*	15.7% (1124/7145)	1.00	---
25-29.9	17.7% (1255/7091)	1.07 (0.98-1.18)	0.12
30 or more	22.1% (581/2634)	**1.15 (1.00-1.33)**	**0.047**
ASA classification			
1-2*	14.3% (1111/7797)	1.00	---
3 or greater	18.0% (3043/16,880)	**1.16 (1.01-1.16)**	**<0.0001**
Smoking status			
Current/former	18.8% (2115/11,271)	**1.08 (1.01-1.16)**	**0.033**
Never*	15.6% (2271/14,539)	1.00	---
Anxiety			
Yes	20.4% (587/2872)	1.07 (0.96-1.19)	0.20
No*	16.3% (3848/23,609)	1.00	---
Depression			
Yes	21.7% (369/1700)	1.13 (0.99-1.29)	0.08
No*	16.4% (4066/24,781)	1.00	---
Substance abuse			
Yes	24.4% (461/1891)	**1.18 (1.03-1.35)**	**0.015**
No*	16.2% (3974/24,590)	1.00	---
Surgery type**			
Fracture fixation	17.7% (2794/15,796)	**1.12 (1.05-1.21)**	**0.001**
Hemiarthroplasty*	15.6% (1488/9542)	1.00	---
Total hip arthroplasty	13.1% (94/717)	**0.78 (0.62-0.98)**	**0.036**
Anesthesia type			
Regional	15.6% (1736/11,117)	**0.92 (0.86-0.99)**	**0.022**
General*	17.6% (2681/15,222)	1.00	---

Analysis excludes 3137 patients who died prior to Q2. The following variables had missing data: BMI (n=9; 0.0%), smoking status (n=49; 0.2%), ASA (n=281; n=1.1%), anesthesia type (n=18; 0.1%).

*Reference group.

**Excludes 37 patients with race/ethnicity classified as other and 59 patients with surgery type classified as other.