Prospective, cohort study of opioid usage after hip arthroscopy for symptomatic femoroacetabular impingement syndrome

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Disclosures - 1

- Daniel Cunningham, B.S.
  - I have no financial relationships to disclose
- Brian Lewis, M.D.
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INTRODUCTION

• The US is in a epidemic of opioid misuse and abuse [1-4]
• Death rates from drug overdoses involving opioids have increased 200% between 2000 and 2014 and are now 1.5 times more common a cause of death than motor vehicle collisions [5]
• Orthopaedic surgeons are the 3rd highest prescribers of opioids [6]
• 70% of people that abuse prescription pain medication divert medications from friends or relatives opioid supplies rather than presenting as a “drug seeker” at a clinic or going to a drug dealer [7]
• 67% of patients undergoing unstage surgery had leftover opioids at 2 months after surgery and few had properly disposed of their leftover opioids [8]
• Both the Institute of Medicine and American Academy of Orthopaedic Surgeons have called for evidence-based standardization of opioid prescribing practices [7,3,9,10]
• There is little knowledge about appropriate opioid prescribing patterns after any type of orthopaedic surgery
• Hip arthroscopy for symptomatic femoroacetabular impingement has grown 90% from 2000 to 2009 [11]
• Surgeons need guidance on appropriate prescribing patterns that take into account individualized patient risk factors

HYPOTHESES

• Many patients use only a small amount of opioid after hip arthroscopy
• Patients risk for increased post-operative opioid use can be stratified based on pre-operative risk factors

METHODS

Pre-operative measures

• Patients ages 18 years or older undergoing hip arthroscopy for symptomatic FAI with either of 2 hip arthroscopy specialists at our institution were approached for inclusion in this IRB-approved study
• Pre-operative risk factors were assessed with validated scoring systems
• Pain and function
  • International Hip Outcome Tool, Short Form (iHOT-12) [12]
  • How difficult is it for you to walk long distances? [12]
  • How much of the time are you afraid of the disability in your hip? [12]
• Visual analog scale (VAS) pain [13]
• “No pain” to “Pain as bad as it could possibly be”
• Psychiatric screening
  • Pain Catastrophizing Scale (PCS) [14]
  • “When I’m in pain, I feel I can’t go on.”
  • “When I’m in pain, I keep thinking about how much it hurts”
• Patient Health Questionnaire 9 (PHQ-9) administered to exclude suicidality [15]
• “Little interest or pleasure in doing things”
• Feeling tired or having little energy
• Pain medication use over the last 2 weeks
• Opioid medication usage
  • Medication name
  • Dosage
  • Frequency per day over the preceding 2 weeks
• Anti-inflammation medication usage
  • Medication name
  • Dosage
  • Frequency per day over the preceding 2 weeks
  
Post-operative measures

• Daily opioid usage until 2-week post-operative visit
• Cumulative opioid usage by 2-week post-operative visit
• Cumulative opioid usage by 6-week post-operative visit

Statistical analysis

• Univariate significance tests between pre-operative covariates and the following outcomes using chi-square tests for binomial outcomes and Student’s t-tests for continuous outcomes
• Whether or not patients had a day without opioid usage before their 2-week post-operative visit
• 2-week post-operative usage
• 6-week post-operative usage
• Covariates with univariate p-value less than 0.05 were incorporated into multivariable linear or logistic regression outcome models

RESULTS

Table 1: Pre-operative measures broken down by patients with (n=39) and without (n=35) pre-operative opioid usage. Averages and 95% CIs shown. 39 patients completed daily post-operative pain medica
diaries.

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Average or proportion without pre-operative opioid (lower 95% CI, upper 95% CI)</th>
<th>Average or proportion with pre-operative opioid (lower 95% CI, upper 95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative pain (of 10 points)</td>
<td>5.0 points (4.2, 5.8) 6.2 points (5.07, 7.41)</td>
<td>5.4 points (4.2, 6.8) 6.9 points (5.4, 7.5)</td>
</tr>
<tr>
<td>PHQ score (of 24 points)</td>
<td>4.5 points (3.6, 5.4) 6.9 points (5.62, 10.16)</td>
<td>4.0 points (2.6, 5.4) 6.1 points (4.6, 11.3)</td>
</tr>
<tr>
<td>iHOT-12 (of 100 points)</td>
<td>12.5 points (9.9, 16.7) 23.1 points (14.3, 31.8)</td>
<td>12.0 points (8.7, 17.3) 22.6 points (14.5, 32.6)</td>
</tr>
<tr>
<td>Gender (proportion male)</td>
<td>3 / 5 (60%)</td>
<td>9 / 15 (60%)</td>
</tr>
<tr>
<td>Pre-operative anti-inflammation medication usage</td>
<td>16 / 35 (45.7%)</td>
<td>5 / 9 (55.6%)</td>
</tr>
</tbody>
</table>

Study Outcomes

Table 2: Outcome measures broken down by patients with (n=39) and without (n=35) pre-operative opioid usage. Averages and 95% CIs shown. 39 patients completed daily post-operative pain medica
diaries.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Average or proportion without opioids before 2-week post-operative visit</th>
<th>Average or proportion with opioids before 2-week post-operative visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients taking opioids everyday until 2-weeks visit (booster)</td>
<td>2 / 35 (6%)</td>
<td>5 / 6 (83.3%)</td>
</tr>
<tr>
<td>2-week opioids used</td>
<td>11.7 / 25 (49.5%)</td>
<td>55.4 / 30 (18.8%)</td>
</tr>
<tr>
<td>6-week opioids used</td>
<td>17.1 / 24 (71.2%)</td>
<td>81.3 / 21 (104.5%)</td>
</tr>
<tr>
<td>Remaining opioids</td>
<td>42.9 / 32 (13.3%)</td>
<td>6.9 / 5 (12.5%)</td>
</tr>
</tbody>
</table>

Table 3: Pre-operative predictors of never achieving a day without opioid usage before the 2-week post-operative visit. Averages and 95% CIs shown. 39 patients completed daily post-operative pain medica
diaries.

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Univariate p-value</th>
<th>Adjusted odds ratio (lower 95% CI, upper 95% CI)</th>
<th>Multivariable p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative pain (proportion usage)</td>
<td>0.0003</td>
<td>10.1 / 1 (0.9, 11.1)</td>
<td>( \chi^2 = 21.8 )</td>
</tr>
<tr>
<td>iHOT-12 (of 100)</td>
<td>0.0499</td>
<td>0.3 / 1 (0.2, 1.0)</td>
<td>0.0727</td>
</tr>
</tbody>
</table>

Table 4: Pre-operative predictors of opioid usage by 2 weeks (n=44). Univariate p-values for each covariate shown. Covariates with univariate p-value less than 0.05 were included into a multivariable outcome model. Adjusted estimates display the additional pills used over baseline after multivariable analysis.

<table>
<thead>
<tr>
<th>2-week post-operative opioid usage</th>
<th>Univariate p-value</th>
<th>Adjusted estimate (lower 95% CI, upper 95% CI)</th>
<th>Adjusted p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative pain (proportion usage)</td>
<td>0.0015</td>
<td>20.4 / 1 (2.9, 12.9)</td>
<td>0.0001</td>
</tr>
<tr>
<td>PHQ score (of 24 points)</td>
<td>0.0285</td>
<td>3.1 / 1 (1.4, 7.7)</td>
<td>0.1001</td>
</tr>
<tr>
<td>iHOT-12 (of 100)</td>
<td>0.0059</td>
<td>0.1 / 1 (0.1, 0.3)</td>
<td>0.0575</td>
</tr>
</tbody>
</table>

Table 5: Pre-operative predictors of opioid usage by 6 weeks (n=44). Univariate p-values for each covariate shown. Covariates with univariate p-value less than 0.05 were included into a multivariable outcome model. Adjusted estimates display the additional pills used over baseline after multivariable analysis.

<table>
<thead>
<tr>
<th>6-week outcomes</th>
<th>Univariate p-value</th>
<th>Adjusted additional pills used (lower 95% CI, upper 95% CI)</th>
<th>Adjusted p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative opioids (proportion usage)</td>
<td>&lt;0.0001</td>
<td>99 / 160 (12.2, 18.3)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>PCS score (of 52 points)</td>
<td>0.0153</td>
<td>1.2 / 1 point (1.5, 3.9)</td>
<td>0.3860</td>
</tr>
<tr>
<td>PHQ score (of 24 points)</td>
<td>0.0325</td>
<td>1.8 / 1 point (1.1, 3.1)</td>
<td>0.4832</td>
</tr>
<tr>
<td>Pre-operative pain (of 7 points)</td>
<td>0.0455</td>
<td>1.5 / 1 point (1.2, 6.7)</td>
<td>0.5303</td>
</tr>
<tr>
<td>iHOT-12 (of 100)</td>
<td>0.0015</td>
<td>0.02 / 1 point (0.7, 0.8)</td>
<td>0.9608</td>
</tr>
</tbody>
</table>

CONCLUSIONS

• Pre-operative opioid usage in the 2 weeks preceding surgery is the most important risk factor for elevated post-operative opioid usage
• 95% of patients without pre-operative opioid usage used less than 25 pills compared to 105 pills for patients with pre-operative opioid usage
• Patients with pre-operative usage consume about 5x more than patients without pre-operative usage by the 2-week and 6-week marks
• 3% of patients with pre-operative usage consumed opioids every day after their surgery at least until the 2-week post-operative visit compared to only 6% of patients without pre-operative usage
• None of the pre-operative pain, psychological, social, or functional scores remained significantly associated with outcomes in multivariable analysis when pre-operative opioid usage was considered
• Patients with pre-operative opioid usage reported higher pain, depression score, and pain catastrophization score with lower function. The pre-operative opioid usage metric may account for these other pre-operative variables and is easier to measure
• For patients without pre-operative opioid usage, pain catastrophization positively correlated with increased opioid usage
• First evidence to guide post-operative opioid prescriptions after hip arthroscopy
• Potential to reduce left-over un-used opioids that may be diverted
• Other surgical indications should be studied

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References