Risk Factors for Opioid Use after Patellofemoral Stabilization Surgery: Analyses of 1,316 Cases

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Background

• Orthopaedic surgeons are the third-highest group of opioid prescribers

• Paucity of literature guiding appropriate opioid use after patellofemoral stabilization surgery

• Identification of risk factors for prolonged opioid use may benefit patients and decrease overall opioid consumption postoperatively
Objectives

- The purpose of this study was to identify risk factors for opioid consumption and opioid prescription refills after patellofemoral stabilization surgery using a large national database.

- We hypothesized that preoperative opioid use and younger age would be independent risk factors for postoperative opioid use.
Methods

- Humana administrative database containing Medicare and private insurance claims for 25 million beneficiaries was queried.
- Patients undergoing primary patellar stabilization surgery between 2007-2017 were included.
Methods

• Patients were categorized into opioid naive (N-OU) and those who filled opioid prescriptions within 3 months prior to surgery (OU)

• Patients in the OU cohort were further categorized into those who filled prescriptions at 1-3 months before surgery (C-OU) and those who filled opioid prescriptions only in the month preceding surgery (A-OU)
Methods

• Statistical Analyses
• Descriptive statistics
• Multivariate analyses to identify risk factors for opioid use at 3 and 12 months postoperatively
• R software (www.r-project.org) housed within PearlDiver
• Statistical significance defined as $p < 0.05$
Results

• 1,316 eligible patients undergoing patellofemoral stabilization procedures were included in analyses

• At one year postoperatively, there was a greater risk of opioid consumption in the OU cohort

• OU vs N-OU: 22.2% vs 4.1%; Relative Risk [RR]: 1.233; 95% CI: 1.172- 1.298; $P < 0.0001$
Results

• Independent risk factors for opioid use at 12 months postoperatively:
  • C-OU
    (OR: 5.74; 95% CI: 3.75-8.9; \( P < 0.0001 \))
  • Obesity
    (OR: 1.76; 95% CI: 1.14-2.69; \( P = 0.0099 \))
  • Preoperatively diagnosed psychiatric comorbidities
    (OR: 1.83; 95% CI: 1.01-3.25; \( P = 0.0435 \))
Results

- Younger age (age <30) was associated with a lower risk of opioid use:
  - At 3 months postoperatively (OR: 0.3, 95% CI: 0.21- 0.44; $P < 0.0001$)
  - At 12 months postoperatively (OR: 0.29; 95% CI: 0.17- 0.46; $P < 0.0001$)
Results

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>3 Months</th>
<th></th>
<th></th>
<th>12 Months</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>P-Value</td>
<td>OR</td>
<td>95% CI</td>
<td>P-Value</td>
</tr>
<tr>
<td>Opioid Use Only 1 Month Before Surgery (A-OU)</td>
<td>2.67</td>
<td>1.66-4.25</td>
<td>&lt; 0.0001*</td>
<td>1.43</td>
<td>0.74-2.64</td>
<td>0.2660</td>
</tr>
<tr>
<td>Opioid Use from 1 -3 Months Before Surgery (C-OU)</td>
<td>9.02</td>
<td>6.20-13.24</td>
<td>&lt; 0.0001*</td>
<td>5.82</td>
<td>3.80-9.04</td>
<td>&lt; 0.0001*</td>
</tr>
<tr>
<td>Age &lt;30</td>
<td>0.30</td>
<td>0.20-0.44</td>
<td>&lt; 0.0001*</td>
<td>0.29</td>
<td>0.18-0.48</td>
<td>&lt; 0.0001*</td>
</tr>
<tr>
<td>Sex, Male</td>
<td>0.88</td>
<td>0.61-1.26</td>
<td>0.4839</td>
<td>1.16</td>
<td>0.77-1.75</td>
<td>0.4677</td>
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<tr>
<td>Psychiatric Diagnosis</td>
<td>1.30</td>
<td>0.74-2.26</td>
<td>0.3565</td>
<td>1.90</td>
<td>1.04-3.39</td>
<td>0.0325*</td>
</tr>
<tr>
<td>Obese</td>
<td>1.42</td>
<td>0.95-2.10</td>
<td>0.0821</td>
<td>1.79</td>
<td>1.16-2.76</td>
<td>0.0082*</td>
</tr>
<tr>
<td><strong>Breakdown by Procedure Type</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Tibial Tubercle Osteotomy</td>
<td>1.01</td>
<td>0.41-2.46</td>
<td>0.9800</td>
<td>2.28</td>
<td>0.86-6.17</td>
<td>0.0968</td>
</tr>
<tr>
<td>Medial Patellofemoral Ligament Reconstruction</td>
<td>1.26</td>
<td>0.71-2.35</td>
<td>0.4479</td>
<td>1.27</td>
<td>0.63-2.80</td>
<td>0.5219</td>
</tr>
</tbody>
</table>

*denotes significant finding (P < 0.05); OR- Odds Ratio; Tibial Tubercle Osteotomy: CPT-27418; Medial Patellofemoral Ligament Reconstruction: CPT-27420, 27422, 27427
Results

Figure 1: Percentage of Patients Filling Opioid Prescriptions

- Opioid Naïve (N-OU)
- Preoperative Opioid Use (OU)
- Acute Opioid Use (A-OU)
- Chronic Opioid Use (C-OU)
Limitations

• Retrospective observational cohort study
• Subject to accurate coding and billing practices within the Humana claims database
• Opioid utilization was assessed through prescription refills
• Patients may also have taken opioid medication that they were not prescribed or filled prescriptions for opioids without utilizing these medications
Conclusions

• Preoperative opioid utilization significantly increased opioid prescription filling following patellofemoral stabilization surgery

• Obesity, preoperative opioid use, and psychiatric comorbidities were independent risk factors for increased opioid use following surgery

• Given the relatively young age and high activity level of patients undergoing patellofemoral stabilization surgery, risk factors for postoperative opioid use warrant further consideration
Thank you!

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