Multimodal Analgesia Therapy Reduces Length of Hospitalization in Patients Undergoing Fusions of the Ankle and Hindfoot

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Disclosure Statement

Multimodal Analgesia Therapy…
James Michelson MD, et al.

My disclosure is in the Final AOFAS Program Book.
I have no potential conflicts with this presentation.
I get paid to take care of patients.
No one in the medical industrial complex gives me any money to do research, talk to them, or sell things for them.
Introduction

Multimodal post-operative analgesia uses multiple medications given perioperatively to block the generation and perception of pain at different points in the nociceptive pathway

- COX-2 inhibitors
- Gabapentinoids
- Acetaminophen
- Opioids
Goal of Study

- Study of the efficacy of multimodal pain protocol compared to traditional pain management
  - Outcome measure – Length of stay after surgery (LOS)
Methods

- Retrospective: All ankle/hindfoot fusions between 2007-2012 performed at Fletcher-Allen Medical Center by 2 F&A Fellowship trained surgeons
- Extensive data and all notes in electronic medical record system
  - Demographics, Labs, Medications, Comorbidities
- Anesthesia – 54% general, 46% spinal (not sig. diff. between the pain protocols)
- No comorbidity exclusions for either protocol
- Choice of pain management up to surgeon
Pain Management

**Multimodal pain protocol**
- **Pre-op:** (oral) long-acting oxycodone, celecoxib, pregabalin, acetaminophen
- **Post-op:** (oral) long-acting oxycodone, celecoxib, acetaminophen, short-acting oxycodone as needed
- **At discharge:** (oral) long and short-acting narcotic (short course), celecoxib/naproxen

**Traditional pain management**
- **Post-op:** IV PCA narcotics, weaned to oral narcotics
- **At discharge:** short-acting narcotics
Results

- 220 patients – 45 received traditional pain management; 175 received multimodal pain protocol
- Pain protocol patients were younger (53.9 years vs 59.7 years; p=.003)
- Both groups were similar with respect to:
  - Gender
  - Smoking/alcohol use
  - Rheumatoid arthritis
  - Maximum glucose
  - Charcot joints
  - Body mass index
  - % revisions
  - Anesthesia type
  - Pre-op HgA1c
  - Diabetes
Results

Impact of Multimodal Pain Protocol on Admission Status and Treatment Costs

<table>
<thead>
<tr>
<th>Multimodal Protocol Use</th>
<th>No (n=45)</th>
<th>Yes (n=175)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient</td>
<td>45(23.%)</td>
<td>151(77.%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Outpatient</td>
<td>0(%)</td>
<td>24(100.%)</td>
<td></td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>4.2 (2.7-5.7)</td>
<td>2.5 (1.4-3.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Professional payments</td>
<td>$1894 ($1512-$2277)</td>
<td>$2067 ($1798-$2336)</td>
<td>0.914</td>
</tr>
<tr>
<td>Hospital Payments</td>
<td>$14957 ($8621-$21294)</td>
<td>$11007 ($9649-$12366)</td>
<td>0.369</td>
</tr>
<tr>
<td>Total Payments</td>
<td>$16852 ($10340-$23363)</td>
<td>$13074 ($11670-$14479)</td>
<td>0.526</td>
</tr>
</tbody>
</table>

Categorical data presented as "count (% of row)"; Continuous data presented as "mean (95% confidence interval)"

* statistical comparisons are by Fisher's Exact Test for categorical data and Mann-Whitney U-Test for continuous data

Length of Stay is significantly decreased with Multimodal Pain Protocol
Results

Length of Stay in Patients with Diabetes or Charcot Joints

<table>
<thead>
<tr>
<th></th>
<th>Multimodal Protocol Use</th>
<th></th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>3.5 (2.15-4.85) n=28</td>
<td>1.67 (1.44-1.9) n=135</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>5.35 (1.9-8.8) n=17</td>
<td>5.43 (.5-10.35) n=40</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Charcot</td>
<td>4.41 (2.7-6.12) n=39</td>
<td>2.53 (1.33-3.74) n=163</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>2.83 (1.29-4.38) n=6</td>
<td>2.5 (1.33-3.67) n=12</td>
<td>0.557</td>
</tr>
</tbody>
</table>

Data is Length of Stay, presented as "mean days (95% confidence interval) n=number of patients in group"

* statistical comparisons are by Mann-Whitney U-Test

Length of Stay is significantly decreased in patients with diabetes, but not those with Charcot joints with Multimodal Pain Protocol
Conclusions

This is the first study of a comprehensive multimodal pain protocol including pre- and post-operative components in a F&A population.

This pain protocol:

- decreased length of stay by over 1 day
- allowed the performance of some fusions as an outpatient that were previously done as inpatients due to pain control issues

Selected References: