TITLE: Slow-Release Opioids for Postoperative Pain: Clinical Effectiveness

DATE: 5 November 2014

RESEARCH QUESTION

What is the clinical effectiveness of slow-release opioids for postoperative pain following elective hip or knee arthroplasty?

KEY FINDINGS

Four randomized controlled trials (RCTs) and three non-randomized studies were identified regarding the clinical effectiveness of slow-release opioids for post-operative pain following elective hip or knee arthroplasty.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2014, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and October 27, 2014. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

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Table 1: Selection Criteria

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<tr>
<td><strong>Population</strong></td>
<td>Patients who have undergone elective hip or knee arthroplasty (total, revision, or partial)</td>
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<tr>
<td><strong>Intervention</strong></td>
<td>Long-acting (slow-release) opioids (e.g., oxycodone slow-release, hydromorphone slow-release, morphine slow-release)</td>
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</table>
| **Comparator** | • Immediate-release opioids (e.g., oxycodone, hydromorphone, or morphine)  
                    • No comparator |
| **Outcomes**   | • Benefits (including adequate pain relief)  
                    • Harms (including inadequate pain relief, drowsiness, confusion, dyspnea, sedation, delirium) |
| **Study Designs** | Health technology assessment reports, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies |

**RESULTS**

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and non-randomized studies.

Four RCTs and three non-randomized studies were identified regarding the clinical effectiveness of slow-release opioids for post-operative pain following elective hip or knee arthroplasty. No relevant health technology assessments, systematic reviews, or meta-analyses were identified.

Additional references of potential interest are provided in the appendix.

**OVERALL SUMMARY OF FINDINGS**

Four RCTs and three non-randomized studies were identified regarding the clinical effectiveness of slow-release opioids for post-operative pain following elective hip or knee arthroplasty.

Some studies comparing treatment with slow release opioids to various alternate interventions (e.g., conventional opioid treatment, placebo) reported positive outcomes including improvements in pain scores, reduced supplemental opioid consumption, increased mobility, and reduced adverse events. Other authors reported negative or neutral outcomes including no change in mobility or pain scores and increased supplemental opioid consumption. Study details and findings are presented in depth in Table 2.
### Table 2. Summary of Findings

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Surgery</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Randomized Controlled Trials</strong></td>
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<td><strong>Non-Randomized Retrospective Studies</strong></td>
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<tr>
<td>Abrisham, 2014</td>
<td>Knee arthroplasty</td>
<td>TFP (2 x 25 µg)</td>
<td>Placebo</td>
<td>- Reduced pain scores.</td>
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<td>- Decreased morphine consumption in TFP group.</td>
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<td></td>
<td>- No differences in side-effects.</td>
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<td>- No differences in post-operative knee flexion.</td>
</tr>
<tr>
<td>Sathikarnmanee, 2014</td>
<td>Knee arthroplasty</td>
<td>TFP (50 µg)</td>
<td>Placebo</td>
<td>- Reduced pain scores and decreased morphine consumption in TFP group.</td>
</tr>
<tr>
<td>Kuusniemi, 2012</td>
<td>Knee arthroplasty</td>
<td>Prolonged-release O/N</td>
<td>O/N</td>
<td>- No difference in pain intensity at rest scores.</td>
</tr>
<tr>
<td>Johnson, 2011</td>
<td>Knee arthroplasty</td>
<td>EREM</td>
<td>CFNB</td>
<td>- Good tolerance in both groups.</td>
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<td></td>
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<td></td>
<td>- Prolonged analgesia in EREM group.</td>
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<tr>
<td>Blackshear, 2010</td>
<td>Hip and knee arthroplasty</td>
<td>EREM (5 to 15 mg)</td>
<td>Other treatment (unspecified)</td>
<td>- Fewer pulmonary embolisms and improved pain control in EREM group.</td>
</tr>
<tr>
<td>Vanterpool, 2010</td>
<td>Hip and knee arthroplasty</td>
<td>EREM</td>
<td>EPID</td>
<td>- Reduced pain scores.</td>
</tr>
<tr>
<td>Schmidt, 2009</td>
<td>Knee arthroplasty</td>
<td>EREM</td>
<td>Perineural infusion</td>
<td>- No difference in pain scores before and immediately after surgery, and at 48 hours.</td>
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<td></td>
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<td>- Reduced pain scores at 12 and 24 hours in EREM group.</td>
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</tbody>
</table>

TFP = transdermal fentanyl patch; O/N = oxycodone/naloxone; CFNB = continuous femoral nerve block; EREM = extended release epidural morphine; EPID = continuous epidural infusion of morphine.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials


Non-Randomized Studies


APPENDIX – FURTHER INFORMATION:

Randomized Controlled Trials – Alternate or Unspecified Surgery Type


Non-Randomized Studies – Alternate or Unspecified Surgery Type
