Review: single dose, oral paracetamol reduces moderate to severe postoperative pain


Is single dose paracetamol (acetaminophen) efficacious and safe for acute postoperative pain?

METHODS


Study selection and assessment: published, double blind, randomised controlled trials (RCTs) that compared single dose, oral, immediate release paracetamol with placebo for moderate to severe postoperative pain (>30 mm on visual analogue scale [VAS]) in adults and allocated >= 10 patients to each treatment group. Exclusion criteria: postpartum trials of pain from uterine cramps alone; pain relief assessed by clinicians, nurses, or carers (rather than patient report); trials <4 hours or no data from 4–6 hours after administration of dose. Two reviewers independently assessed individual study quality using the 3 item Jadad scale and a consensus score (maximum 5 points).

Outcomes: proportion of patients with >=50% pain relief at 4–6 hours (based on hourly patient reports over 4–6 h using validated pain scales) and adverse effects.

MAIN RESULTS

47 trials (n = 4186) met the selection criteria. Trials assessed pain after dental surgery (n = 25); elective general, gynaecological, urological, and orthopaedic surgery (n = 12); and episiotomy and Caesarean section (n = 10). Meta-analysis was done using a fixed effects model. Mean proportion of patients experiencing >=50% pain relief over 4–6 hours was greater in patients who received paracetamol (325, 500, 600/650, 975/1000, or 1500 mg) than in those who received placebo (table). Paracetamol, 975/1000 mg, did not differ from placebo for drowsiness/sleepiness/somnolence, dizziness, nausea, vomiting, or headache.

For correspondence: Ms J Barden, Pain Research Unit, University of Oxford, Oxford, UK. jodie.barden@pru.ox.ac.uk

Sources of funding: Anglia and Oxford RHA UK; NHS Research and Development Health Technology Evaluation Programmes UK; European Union Biomed 2 UK.

<table>
<thead>
<tr>
<th>Dosage of paracetamol</th>
<th>Number of trials (n)</th>
<th>Paracetamol &amp; Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>325 mg</td>
<td>1 (100)</td>
<td>69%</td>
</tr>
<tr>
<td>500 mg</td>
<td>6 (561)</td>
<td>61%</td>
</tr>
<tr>
<td>600/650 mg</td>
<td>19 (1886)</td>
<td>38%</td>
</tr>
<tr>
<td>975/1000 mg</td>
<td>23 (2759)†</td>
<td>46%</td>
</tr>
<tr>
<td>1500 mg</td>
<td>1 (65)</td>
<td>65%</td>
</tr>
</tbody>
</table>

Event rates for >=50% pain relief within 4–6 hours after surgery:

- 325 mg: 60% (10 to 130); NNT (CI): 4 (3 to 14)
- 500 mg: 90% (60 to 130); NNT (CI): 4 (3 to 5)
- 600/650 mg: 140% (100 to 180); NNT (CI): 5 (4 to 6)
- 975/1000 mg: 150% (120 to 180); NNT (CI): 4 (4 to 5)
- 1500 mg: 70% (20 to 140); NNT (CI): 4 (3 to 10)

*Abbreviations defined in glossary; RBI calculated from relative benefit data in article.†Information provided by author.

CONCLUSION

Single dose, oral paracetamol at doses ranging from 325–1500 mg provides >=50% pain relief of moderate to severe postoperative pain for 4–6 hours, with few adverse effects recorded.

Commentary

Pain is not always well controlled after surgery. This can make patients anxious and reluctant to mobilise and take deep breaths, which can increase the risk of postoperative complications, such as chest infection and deep venous thrombosis. Although paracetamol is sometimes dismissed as a weak analgesic, partly because it is available over the counter, the review by Barden et al clearly shows that it can be an effective analgesic for moderate to severe pain after surgery. The results for dosages of 600/650 mg and 975/1000 mg were based on larger numbers of patients than other dosages assessed and therefore are more robust.

Although paracetamol is associated with potentially serious adverse events (up to half of the cases of liver failure in the UK are thought to be the result of paracetamol), such consequences are rare in therapeutic use. Paracetamol is a relatively inexpensive drug, which is widely available as a generic preparation. It is a useful analgesic after surgery for patients with contraindications to non-steroidal anti-inflammatory drugs (eg, patients with asthma or peptic ulcer). The number needed to treat (NNT) to achieve >=50% pain relief over 4–6 hours of 3.8 for paracetamol, 975/1000 mg (95% CI 3.4 to 4.4) compares well with aspirin, 600/650 mg, which has an NNT of 4.4 (CI 4.0 to 4.9). Ibuprofen, 400 mg, has an NNT of 2.4 (CI 2.3 to 2.6). Interestingly, the NNT for morphine, 10 mg intramuscularly, is 2.9 (CI 2.6 to 3.9). The newer Cox-2 inhibitors seem promising for managing acute pain, with rofecoxib, 50 mg, having an NNT of 1.9 (CI 1.8 to 2.1). Overall, paracetamol is a useful analgesic after surgery and can be helpful when providing balanced postoperative analgesia.

Katie Seers, RGN, PhD
RCN Institute
Oxford, UK