Effectiveness of pre-emptive analgesia is unproven


Objective
To determine whether analgesics given before surgery (pre-emptive) offer better pain control than analgesics given after surgery.

Data Sources
Studies were identified in MEDLINE (1966 to 1994). The 50 journals with the greatest number of studies in MEDLINE and 9 selected specialist journals were handsearched.

Study Selection
Studies were selected if they were randomised controlled trials (RCTs) that compared the outcome when analgesics were given before surgical incision with the outcome when the same medication was given after surgical incision. Studies that compared pre-emptive analgesia with no analgesia or that compared pre-emptive analgesia with pre-emptive analgesia plus analgesia given after surgery were excluded. 15 studies that included 704 patients met the inclusion criteria.

Data Extraction
Data were extracted that pertained to study design; type of surgery; type, dosage, and scheduling of pain medication; and outcome measures (categorical pain intensity score, visual analog scale of pain intensity, time to first analgesia, and time to patient-controlled analgesia). Studies were divided into 3 drug classes (nonsteroidal anti-inflammatory drugs [NSAIDs], 4; local anaesthetic, 7; and opioids, 4).

Main Results
3 RCTs compared NSAIDs and 1 compared paracetamol given before and after surgery. None of the trials showed pre-emptive analgesia to have a beneficial effect in pain control compared with the same medications given after surgery. 7 trials compared local anaesthetic given before and during or after surgery (epidural, 4; nerve block, 1; and infiltration, 2). 1 trial showed delayed time to first request for pain medication in patients who received pre-emptive local anaesthetic infiltration compared with patients who received infiltration before closure. Of 4 studies that compared opioid administration before and during surgery, 1 showed that patients who received a lumbar epidural before surgery had lower visual analog scale of pain intensity scores 6 hours after surgery, 1 showed decreased patient-controlled morphine consumption within 24 hours of surgery, and 1 showed lower categorical pain intensity scores at the time of remedication. A fourth study showed a higher pain score in patients who received pre-emptive intravenous alfentanil compared with patients who received it after skin incision.

Conclusion
Studies that compared outcomes when the same pain medication is given before, after, or during surgery show no beneficial pre-emptive effect of nonsteroidal anti-inflammatory drugs, a benefit in 1 study of local anaesthetic given pre-emptively, and modest effects of opioids given pre-emptively in 3 studies, but a negative effect in a fourth.

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Commentary
Aggressive perioperative pain control is not only humane but can speed recovery and diminish complications (1). Biologic similarities between persistent pain and normal memory (2) prompted animal investigations, which showed that long-term spinal cord sensitization can be prevented by blockade of acute pain impulses. Most clinical trials to date, however, have failed to test this model of complete pain control before, during, and after surgery and have studied the related but narrower question of whether single doses of analgesic drugs given before surgery produce better outcomes than the same doses given afterwards.

Therefore, it is not surprising that the studies reviewed by McQuay led to the conclusion that the effectiveness of pre-emptive analgesia is unproven. Most of these trials compared active treatment only before surgery with treatment only after surgery. They are difficult to consolidate because of the different drugs, dosages, operations, and specific analgesic interventions used, and few achieved the zero pain judged essential for success from the basic experiments.

It also is not surprising that other reviews in this area are more sanguine. Although Dahl (3) reached similar conclusions about the clinical trial data, he emphasized differences between convincing preclinical studies and inconclusive clinical studies and remained optimistic about pre-emptive analgesia. Similar optimism was expressed by Woolf and Chong (4), who also called for aggressive analgesia before, during, and after surgery. Therefore, although readers should heed McQuay's assessment of the trials he reviewed, his results should not be extrapolated to the conclusion that no benefit can be derived from pre-emptive analgesia. Because the animal data are so convincing, the regimen of complete pain control before, during, and after surgery that the data suggest has not been adequately tested; and needless pain is itself a bad outcome, we should strive to suppress perioperative pain.

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References
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