A systematic review of postoperative analgesia following laparoscopic colorectal surgery
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CRD summary
This review found there was a paucity of research and no clear evidence that one postoperative analgesic regime was superior to another following laparoscopic colorectal surgery. Given the lack of information provided for the results and the potential for various biases, the results of the review should be interpreted with caution and the reliability of the authors' conclusions is unclear.

Authors' objectives
To examine the effects of analgesic regimens on short-term outcomes in patients following laparoscopic colectomy.

Searching
PubMed, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), and the Institute of Health and Life Sciences were searched to September 2008 for relevant studies in any language; search terms were reported. Reference lists of retrieved articles were checked to identify additional studies.

Study selection
Randomised controlled trials (RCTs), comparative observational studies or cohort studies that evaluated different analgesic regimes in patients who had undergone elective laparoscopic colorectal resections for benign or malignant conditions were eligible for inclusion. Studies in which the procedure was laparoscopically assisted with a hand port or if a laparotomy incision was routinely used to complete the colonic mobilisation were excluded, but not if incisions were made for specimen extraction and/or anastomosis.

The primary outcome was length of hospital stay. Secondary outcomes evaluated were pain, vomiting, time to tolerance of normal diet, return of bowel function, the incidence of post-operative complications and readmissions.

The interventions included epidural ropivacaine or bupivacaine, spinal bupivacaine, or intravenous ketorolac or lidocaine. Most of the included studies evaluated epidural anaesthesia versus patient-controlled analgesia or intravenous morphine; other studies compared different forms of spinal anaesthesia (ketorolac or lidocaine) with placebo. The epidural levels ranged from T8 to T12; the duration of epidural administration ranged from 18 hours post surgery to five days post surgery. Bowel preparation was routinely used in some studies. The use of fast-track elements were reported in some studies.

Two reviewers independently performed the search, but it was not clear how many reviewers performed the study selection.

Assessment of study quality
The Jadad 5-point scale was used to assess the methodological quality of the included studies according to the appropriateness of sequence generation, allocation concealment and blinding, use of selective reporting, and the treatment of incomplete outcome data.

The authors did not state how many reviewers performed the quality assessment.

Data extraction
Data were extracted data as reported in the included studies. Where possible, odds ratios (OR) and 95% confidence intervals (CI) were calculated. The reviewers attempted to contact the study authors for missing data where medians were presented.

The review authors did not state how many reviewers performed the data extraction.
Methods of synthesis
Pooled odds ratios and 95% confidence intervals were calculated using a Mantel-Haenszel random-effects model. Other data were summarised in a narrative synthesis.

Results of the review
Eight studies were included in the review (n=331 patients), comprising six RCTs, one observational study that was a subgroup of another RCT and one consecutive-matched cohort study. Two RCTs were given a Jadad score of 1 point, one RCT scored 3 points, one RCT scored 4 points, and two RCTs plus the observational study scored of 5 points.

Epidural or intravenously-administered analgesia versus patient-controlled analgesia: Three RCTs and one observational study found no significant differences in length of hospital stay between the two treatment groups. One RCT found a reduction in time to tolerance of a normal diet, a reduced time to flatus, a reduced time to bowel opening and lower pain scores in the epidural group. In another RCT, pain scores were lower in the epidural group compared with the patient-controlled analgesia group. The observational study found that there was a significantly shorter time to bowel opening in the epidural group than in the patient-controlled analgesia group.

Epidural versus intravenous analgesia: The cohort study found that there was a significant difference in hospital stay (shorter stay) in the epidural ropivacaine group.

Intravenous analgesia versus placebo: One RCT (n=40 patients) showed reduced length of hospital stay, reduced time to flatus, reduced time to bowel opening, and lower pain scores for the intravenous lidocaine-treated group. One RCT (n=44 patients) showed that the use of intravenous ketorolac was associated with a significantly reduced time for tolerance of a normal diet, time to flatus, and lower pain scores compared with placebo; the incidence of anastomotic leakage was higher in the ketorolac group than the placebo group, but there were no differences in the admission rates between the groups.

There were no differences between treatments for nausea and vomiting, readmission rates, urinary retention, or hypotension.

Authors' conclusions
There was a paucity of research that evaluated the benefits of postoperative analgesic regimes following laparoscopic colorectal surgery. No particular analgesic protocol conferred significant advantages over another. Further studies, particularly of spinal analgesia, are required to determine the most appropriate analgesic regime following laparoscopic colorectal surgery.

CRD commentary
The review addressed a clear question and criteria for the inclusion of studies in the review were stipulated. Appropriate databases were searched for primary studies, with no language restrictions. There was a limited search for unpublished studies, so there may be a risk of publication bias. The reviewers reported steps to minimise errors and biases in the search for studies, but not for study selection, data extraction or the assessment of methodological quality.

The authors' decision not to pool the results of the studies was justified given the heterogeneity of interventions and analgesic administration. Little data was provided for the results, so their reliability was unclear.

The authors' conclusions are based on the evidence presented, but the lack of information provided on the results and the potential for various biases mean that the results of the review should be interpreted with some caution and that the reliability of the conclusions is unclear.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that more well-designed trials comparing analgesic regimens within enhanced recovery programmes are required to determine the most appropriate analgesia for patients after laparoscopic colorectal surgery. The experience of the surgeons performing the surgery should also be considered as this may impact on the use of...
accelerated post-operative care after laparoscopic colonic resection.

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