Evaluation of novel local anesthetic wound infiltration techniques for postoperative pain following colorectal resection surgery: a meta-analysis

Ventham NT, O'Neill S, Johns N, Brady RR, Fearon KC

CRD summary
This review found that novel local anaesthetic blocks appeared to provide better pain relief than placebo, with routine analgesia in colorectal surgery. Caution is warranted when interpreting these results due to the diversity of the included trials.

Authors’ objectives
To evaluate the efficacy of novel local anaesthetic techniques in colorectal surgery.

Searching
The authors searched MEDLINE, EMBASE and The Cochrane Library for studies published from 1990 to February, 2013, with no language restrictions. Unpublished trials were sought through ClinicalTrials.gov. The bibliographies of included studies were searched. Search terms were reported.

Study selection
To be eligible, studies had to be randomised controlled trials (RCTs) of adults (over 16 years old) undergoing open or laparoscopic colonic or rectal resection, for neoplastic or benign disease. Eligible interventions were transversus abdominis plane (TAP) block, intraperitoneal local-anaesthetic instillation, and local-anaesthetic infiltration by wound catheter. Ineligible interventions were subcutaneous local anaesthetic infiltration, infiltration of a drug other than a local anaesthetic, neuraxial analgesia, and intravenous local anaesthetic. The comparator had to be placebo or routine analgesia. The primary outcome was intravenous equivalent morphine consumption in milligrams (mg) at 24 hours after surgery. Other outcomes were morphine dose at 48 hours; pain at 24 and 48 hours, on movement and at rest; and recovery and complications.

In the included trials, the mean age by trial group varied from 42.2 years to 70.3 years. Where reported, the percentage of females varied from 22.9 to 66.7.

It was unclear how many reviewers were involved in study selection.

Assessment of study quality
Two authors independently assessed the quality of the trials, using a 15-point scale adapted from four published quality assessment tools.

Data extraction
For the opioid outcomes, the doses of alternative opioids were converted to intravenous morphine equivalent doses, using recognised conversion rates. Numerical rating scale measures of pain were converted to a continuous scale of 0 to 10, if necessary. The data were extracted directly, extrapolated from graphs, or requested from authors. If they could not be obtained, the mean and standard deviation were estimated from the median, range and group number.

Two authors were involved in data extraction.

Methods of synthesis
The data were pooled in meta-analyses. For dichotomous data, odds ratios were pooled, with 95% confidence intervals. For continuous data, weighted mean differences, with 95% confidence intervals, were pooled, with weighting by sample size. Heterogeneity was assessed using $I^2$, $X^2$ and $I^2$. Where $I^2$ was less than 50%, it was rated low; 51 to 75% was medium; and over 75% was high.

Each analgesic modality was analysed separately. Subgroup analyses were performed for anatomical layer of wound infiltration, and type of surgery (laparoscopic or open).
Results of the review
Twelve RCTs (902 participants) were included in the review. Sample size varied from 16 to 167 participants. Quality scores ranged from 6 to 14.

At 24 hours, there was no statistically significant difference between local anaesthetic wound infiltration and placebo or no treatment, for opiate requirement (WMD -16.4mg, 95% CI -34.2 to 1.5; I²=99%; 10 trials; 762 patients). At 48 hours, there was a statistically significant lower opiate requirement in the local anaesthetic group (WMD -15.5mg, 95% CI -25.3 to -5.6; I²=80%; seven trials; 622 patients).

Further results were reported and showed statistically significant, lower pain scores on movement, for the local anaesthetic group, at 24 hours and at 48 hours, but no difference between groups for pain scores at rest. Local anaesthetic was associated with a shorter hospital stay and earlier resumption of diet. Wound complications did not tend to differ between groups.

Authors' conclusions
The meta-analysis suggested that novel local anaesthetic blocks provided better pain relief than placebo, with routine analgesia.

CRD commentary
This review was based on defined inclusion criteria for participants, intervention, outcomes and study design. Searching covered a few databases, but unpublished trials and those in languages other than English were eligible, minimising the risk of publication bias. Quality was assessed and the results were presented. Two reviewers were involved in data extraction and quality assessment, which helped to minimise bias. Statistical pooling and the subgroup analyses appear to have been appropriate.

The diverse trials were statistically heterogeneous and caution is warranted when interpreting the pooled results.

Implications of the review for practice and research
Practice: The authors stated that novel local anaesthetic blocks could be integrated into a multimodal enhanced recovery programme for colorectal surgery.

Research: The authors did not state any implications for research.

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