Local anesthetic infiltration for postoperative pain relief after laparoscopy: a qualitative and quantitative systematic review of intraperitoneal, port-site infiltration and mesosalpinx block

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Authors' objectives
To evaluate the effects of peripherally applied local anaesthetics (intraperitoneal, installation, trocar- and port-site wound infiltration, and visceral infiltration/application) on postoperative pain in patients undergoing laparoscopic surgery, by using evidence from all double-blinded, relevant randomised controlled trials.

Searching
The Cochrane Library (1999 issue), MEDLINE (from 1966 to May 1999) were searched using the following search terms, with free text combinations: 'laparoscopy', 'laparoscopic', 'surgery', 'cholecystectomy', 'sterilisation', 'intraperitoneal', 'wound infiltration', 'incisional', 'visceral', 'postoperative pain', 'local anaesthesia', 'bupivacaine', 'lidocaine', and 'ropivacaine'. There were no language restrictions. Additional reports were identified from reference lists of retrieved reports and review articles. No abstracts or unpublished reports were included.

Study selection
Study designs of evaluations included in the review
Double-blind randomised controlled trials (RCTs) of peripheral local anaesthetics (LA) compared with placebo or no treatment in the control of postoperative pain after laparoscopic surgery. Studies of open abdominal surgery and direct comparison of local anaesthetic treatment with other treatment modalities were not considered.

Specific interventions included in the review
Intraperitoneal, installation, trocar- and port-site wound infiltration and visceral infiltration/application. Comparisons were placebo (saline) and no treatment.

Participants included in the review
Adults (defined as older than 15 years) undergoing laparoscopic surgery (cholecystectomy, diagnostic and operative gynaecological laparoscopy, sterilisation, fundoplication, appendectomy or hernia repair).

Outcomes assessed in the review
Visual analogue scale (VAS) pain scales. Also reported qualitatively was supplementary analgesic consumption and time to first analgesic request.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The trials were scored by using a three-item 1-5 quality scale (see Other Publications of Related Interest no.1). Studies were scored for randomisation, method of randomisation, and blinding of patients/investigators. Each report meeting the inclusion criteria was read by each of the authors, and consensus was subsequently achieved.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. Data were extracted on: number of patients in each arm, bupivacaine mg and percentage volume, pain scores, and supplemental analgesic consumption.
Methods of synthesis
How were the studies combined?
The weighted mean difference was calculated, taking into account study size and standard deviations of the VAS scales. Studies using a pain scale other than the VAS (e.g. McGill or verbal rating scales) were not included in the quantitative analysis. When data only allowed a qualitative analysis, post-operative effectiveness was evaluated by a significant difference (p<0.05) in pain relief using pain scores (VAS or similar scores), time to first analgesic request, and consumption of supplementary analgesics compared with control.

How were differences between studies investigated?
Studies were grouped by type of operation.

Results of the review
A total of 41 trials with data from 2794 patients were considered appropriate for analysis.

Of the 41 RCTs, 13 evaluated intraperitoneal LA after cholecystectomy, four RCTs assessed intraperitoneal LA after other procedures, eight RCTs evaluated port-site infiltration after various procedures, 12 RCTs evaluated mesosalpinx or fallopian tube block after sterilisation, and four RCTs considered combined LA regimens. The median quality score was 3.

Improved pain relief was observed in seven of the 13 RCTs of intraperitoneal LA after cholecystectomy and in four RCTs of other procedures. A statistically significant weighted mean difference of -13 mm visual analogue scale (95% confidence intervals (CI): -20, -6) in favour of the treatment groups was observed after cholecystectomy. Three of eight trials of port-site infiltration showed significant differences but questionable clinical importance and validity in two; weighted mean difference was not statistically significant between treatment groups (95% CI: -9, 1). All RCTs of mesosalpinx or fallopian tube block after sterilisation showed improved pain relief with a statistically significant weighted mean difference of -19 mm (95% CI: -25, -14) in favour of treatment groups. Data of combined regimens were positive, although sparse.

Authors' conclusions
There was evidence for a statistically significant, but clinically questionable, important effect of intraperitoneal LA for postoperative pain control. There was evidence for a significant but short-lasting effect of mesosalpinx/fallopian tube block after sterilisation, but there was a lack of evidence for any important effect of port-site infiltration. Data from combined regimens were too sparse for conclusions.

CRD commentary
This is a well-written review with clear inclusion criteria and a reasonable search strategy. However, unpublished trials are not included and thus the possibility of publication bias cannot be ruled out. The methods of the review are relatively clearly stated, validity of the included studies is assessed and reported in the results. The authors' conclusions appear to follow on from the results of the review.

Implications of the review for practice and research
Practice: The authors state that this systematic review confirms intraperitoneal and mesosalpinx local anaesthetic block, not port-site infiltration, to have some impact on postoperative pain after laparoscopy.

Research: The authors state that the data presented in this review indicate a need for more large-scale, large-dose pharmacokinetic studies of combined large-dose, somato-visceral local anaesthetic block in different laparoscopic procedures to reduce post-operative pain.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.