Local anaesthetic vs. general anaesthetic for inguinal hernia repair: systematic review and meta-analysis

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CRD summary
The review found that local anaesthesia reduced nausea and accelerated return to normal activities after open inguinal hernia repair, compared with general anaesthesia, but that overall local anaesthesia showed little benefit over general. Given limitations in the review, including a suboptimal search, limited reporting of review methods and unexplained heterogeneity between the trials, the authors’ conclusions may not be reliable.

Authors’ objectives
To evaluate differences in outcome after local versus general anaesthesia for inguinal hernia repair.

Searching
PubMed and EMBASE were searched to May 2008. Search terms were reported. Related articles were traced, relevant reference lists and Current Controlled Trial register were also checked. Two journals (the British Journal of Surgery and the Annals of the College of Surgeons of England) were searched for posters and presentations from major national meetings. The search was limited to studies in English published since 1966.

Study selection
Randomised controlled trials (RCTs) comparing postoperative outcomes after local versus general anaesthesia for inguinal hernia repair were eligible for inclusion. Outcomes had to be reported in at least three RCTs to be eligible for inclusion in meta-analysis.

The included trials were set in general hospitals among participants having elective or emergency surgery for a groin hernia. The age and body mass index of participants in the review was similar across the included studies (where reported). Most studies excluded men with recurrent hernias or with a preference or indication for a specific type of anaesthetic. A variety of techniques were used for hernia repair, including tension-free mesh, open mesh and non-mesh. General, regional and/or local anaesthetic was used. In some, but not all trials, patients in the general anaesthesia group also received local anaesthesia.

The included trials reported over 50 different outcomes. Review outcomes were postoperative nausea, urinary retention, time to return to work and to normal social activities, operating time and theatre occupancy time. Outcomes reported with non-parametric data (e.g. visual analogue scales) were not included in the review.

The authors did not state how the papers were selected for the review.

Assessment of study quality
The following components of study validity were reported in study tables: methods of randomisation and allocation concealment and use of intention-to-treat analysis.

The authors did not state how many authors conducted the assessment.

Data extraction
Odds ratios (ORs) were extracted or calculated for dichotomous outcomes and mean differences between the groups for continuous outcomes, with 95% confidence intervals (CIs). One reviewer performed the data extraction. Data on participants who received regional anaesthesia were excluded from analysis.

Methods of synthesis
Trials were combined using a random-effects DerSimonian and Laird model to calculate pooled odd ratios and weighted mean differences (WMDs), with 95% confidence intervals. Heterogeneity was evaluated using the Q statistic (level of significance p<0.05).

Results of the review
Five RCTs were included (n=895 patients analysed, excluding 228 patients who had regional anaesthesia; range 50 to 616 patients). Appropriate methods of randomisation and/or allocation concealment were described by four RCTs. Two RCTs used intention-to-treat analysis.

Participants receiving local anaesthesia had significantly less risk of postoperative nausea (OR 0.30, 95% CI 0.15 to 0.61; three RCTs) and the time they took to return to normal activities was significantly shorter by one day (WMD -1.0 day, 95% CI -1.8 to -0.5; three RCTs).

There was no statistically significant difference between the groups in rates of urinary retention, time taken to return to work (three RCTs), operating time (three RCTs) or theatre time (three RCTs). There was statistically significant heterogeneity for the following outcomes: time taken to return to work (p=0.04), operating time (p=0.004) and theatre time (p=0.004).

Authors' conclusions
Local anaesthesia reduced nausea and accelerated return to normal activities after open inguinal hernia repair, compared with general anaesthesia. However, overall local anaesthesia showed little benefit over general anaesthesia.

CRD commentary
The objectives and inclusion criteria of the review were clear and relevant sources were searched for studies. However, the restriction to published studies in English meant that the review was prone to publication and language biases, so some studies may have been missed. Publication bias was not formally assessed. Data extraction was carried out by a single reviewer, and the processes of study selection and validity assessment were not described in detail. Failure to have more than one reviewer carry out these processes independently increased the risk of reviewer bias and error.

Some aspects of study quality were apparently assessed, but no details were provided on some important components of quality (e.g. blinding, drop-out rates), and quality was not taken into account in interpreting the findings. The decision to select review outcomes according to those reported in three or more trials did not appear to be clinically or methodologically sound, especially as the authors recommended that future studies should report specific outcomes (e.g. rates of haematoma, ischaemic orchitis, recurrence) that they did not include in the review (even though they may have been reported in individual trials). The statistical methods used to combine the data and assess for heterogeneity appeared appropriate, but where significant heterogeneity was found, it was not acknowledged in the text or explored.

Given limitations in the review, including a suboptimal search, limited reporting of review methods and unexplained heterogeneity between the studies, the authors’ conclusions may not be reliable.

Implications of the review for practice and research
Practice: The authors stated that choice of anaesthesia for inguinal hernia repair should be determined by the preference of the individual patient or surgeon, since there is little difference in clinical outcomes between the two.

Research: the authors stated that definitive comparison of the risks and benefits of local and general anaesthetic for inguinal hernia would require a large sample in a well-designed study, with participants in the general anaesthetic arm also receiving local anaesthesia.

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