Systematic review of the effectiveness and safety of laparoscopic cholecystectomy

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Authors' objectives

To compare the effectiveness, safety and post-operative recovery from laparoscopic cholecystectomy (LC) with those of conventional open cholecystectomy (OC) and mini-cholecystectomy (MC).

Searching

MEDLINE and EMBASE were searched from 1987 onwards using the primary search term 'laparoscopic cholecystectomy'. Searches were refined combining the primary search term and using one of the following terms: 'randomised controlled trial', 'clinical trial', 'cohort study', 'case-control study', 'operative complications' and 'evaluation'. Numerous health-related organisations were also contacted for information on grey publications, current studies, or papers in press. The reference lists of the identified papers were also checked.

Study selection

Study designs of evaluations included in the review

Randomised controlled trials (RCTs) and non-randomised trials were included.

Specific interventions included in the review

LC compared with conventional OC and MC.

Participants included in the review

Patients with symptomatic gallstones were included.

Outcomes assessed in the review

The following outcomes were assessed: intra-operative events; post-operative complications rates paying particular attention to bile duct injury; post-operative pain; length of hospital stay; time to return to normal activities; quality of life following the operation; and change in symptoms.

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 authors performed the selection.

Assessment of study quality

Each paper was assigned a score for internal and external validity based on predetermined quality criteria. The criteria for internal validity were modifications of those described by Goodman (see Other Publications of Related Interest). The authors do not state how the papers were assessed for validity, or how many of the authors performed the validity assessment.

Data extraction

The authors do not state how the data were extracted for the review, or how many of the authors performed the data extraction.

Methods of synthesis

How were the studies combined?

The studies were not combined because of the heterogeneity of the studies. The results were described narratively.

How were differences between studies investigated?
Differences between the studies were investigated in the narrative.

**Results of the review**

Fifteen RCTs, 21 non-randomised trials or prospective cohort studies, 8 non-parallel and retrospective cohort studies, and 30 case series, were included.

There was no evidence for a difference in symptomatic outcomes between LC, OC, and MC. Sixty to 70% of the patients achieved complete alleviation of symptoms 6 months to one year after cholecystectomy.

There was weak evidence that mortality and overall complication rates were lower following LC than in OC.

There was no evidence for a difference in mortality and overall complication rates between LC and MC.

There was weak evidence that the rate of biliary tract complications were greater in LC than in OC and MC.

There was strong evidence that LC causes less deterioration of post-operative pulmonary function than OC and MC, but the clinical importance of this is unknown.

Surgeons' training, experience, and ability are likely to have an important effect on the risk of complications. The level of experience in laparoscopic surgery in the UK is extremely variable. There was no evidence for a significant difference in homeostasis following LC, compared with OC and MC.

There was strong evidence that the post-operative pain experienced following LC was less than that following OC and MC.

Post-operative hospital stay after LC and MC is likely to be the same or similar for LC and MC. It is probably greater after OC, but it was not possible to quantify the difference.

Differences in the reported time to return to normal activity between LC and OC or MC patients were likely to have been overestimated. There was some evidence that LC patients recover more quickly, but there was no evidence for differences 3 months after surgery.

**Authors' conclusions**

Surgeons should not be encouraged to replace MC with LC. Valid standardised systems for grading and classifying the complications arising from surgery, and the severity of patients, should be promoted. A large population-based prospective cohort study should be undertaken in order to provide accurate data on long-term outcomes (complication rates, symptomatic recovery, quality of life, and patient satisfaction) following LC, OC and MC.

**CRD commentary**

This was a well-written and rigorous review. However, more details were needed on the methods for determining the relevance of primary studies, the data extraction, and how the quality criteria were judged. The authors did not undertake a meta-analysis, which was appropriate.

**Implications of the review for practice and research**

Surgeons should not be encouraged to replace mini-cholecystectomy with laparoscopic cholecystectomy. A large population-based cohort study should be undertaken to provide accurate data on long-term outcomes following laparoscopic-, open-, and mini-cholecystectomy.

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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.