Robot-assisted laparoscopic hysterectomy vs traditional laparoscopic hysterectomy: five metaanalyses
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CRD summary
Robot-assisted laparoscopic hysterectomy was associated with shorter length of stay, fewer postoperative complications and fewer conversions to laparotomy compared to traditional laparoscopic hysterectomy. A lack of information about the quality and design of included studies and uncertainty regarding the suitability of analyses mean that the authors’ conclusions should be treated with caution.

Authors' objectives
To compare the impact of robot-assisted laparoscopic hysterectomy with traditional laparoscopic hysterectomy on blood loss, operative time, length of stay, conversions to laparotomy and postoperative complications.

Searching
MEDLINE, PubMed, EMBASE and the Science Citation Index were searched up to March 2011 for articles published in English. Search terms were reported.

Study selection
Studies were eligible for inclusion if they compared robot-assisted with traditional laparoscopic hysterectomy and reported quantitative measures of at least one of the outcomes: estimated blood loss, length of stay, operative time, number of conversions to laparotomy and number of postoperative complications. Studies needed to report patient demographic data. Both malignant and benign diseases were eligible for inclusion.

Included studies compared robot-assisted laparoscopic hysterectomies with traditional laparoscopic hysterectomies in women with mean ages from 41 to 63.5 years in the robot-assisted group and from 41.9 to 68.4 years in the traditional group. Where reported, body mass index across both groups ranged from 22.5 to 35.3. Where reported, mean uterine weight ranged from 109g to 270g. The number of nodes ranged from 6.4 to 100. Some patients also underwent lymphadenectomy.

The authors stated that they followed the QUORUM statement. They did not state how many reviewers performed the study selection.

Assessment of study quality
The authors stated that they evaluated the quality of included studies. No further details or results were provided.

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

Data extraction
For dichotomous data, the number of events in each group was extracted and used to calculate odds ratios (ORs) with corresponding 95% confidence intervals (CI). For continuous data, means and pooled standard deviation or the median and range for each group were extracted and used to calculate effect sizes using Cohen’s d.

The authors did not state how many reviewers extracted data for the review.

Methods of synthesis
For dichotomous data odds ratios adjusted by weight and their 95% CIs were calculated. For continuous data the authors reported that they calculated pooled effect sizes with 95% CIs using fixed-effect and random-effects models. Malignant and benign lesions were considered together. However, the figures seemed to indicate that odds ratios were calculated for these outcomes.

A correction factor of 0.5 was added to zero counts for events. Statistical heterogeneity was assessed using $T^2$ and $I^2$. Publication bias was assessed using funnel plots. T-tests were performed between malignant and benign cases and
subgroup analyses were performed where significant differences were found. T-tests were carried out between robot-assisted and traditional laparoscopic hysterectomy for uterine weight. Sensitivity analyses excluded the study with the largest sample and checked the differences between studies using random-effects versus fixed-effect models.

Results of the review
Twenty-one studies were included for review (2,666 participants). Study design was not reported.

Patients who underwent robot-assisted laparoscopic hysterectomy had a significantly shorter length of stay (summary effect -0.43, 95% CI -0.68 to -0.17, p=0.05; 17 studies) and fewer postoperative complications (summary OR 0.69, 95% CI 0.43 to 1.09; 14 studies) compared to patients who underwent traditional laparoscopic hysterectomy. There were significantly fewer conversions to laparotomy with robot-assisted laparoscopic hysterectomy compared to traditional laparoscopic hysterectomy (OR 0.50, 95% CI 0.31 to 0.79; 15 studies). There was no significant difference between robot-assisted and traditional laparoscopic hysterectomy in operative time or estimated blood loss. There was no evidence of significant statistical heterogeneity for any outcomes.

For the outcomes of operative time and postoperative complications, t-tests showed significant differences between benign and malignant cases. The results of subgroup analyses for these outcomes were reported. Sensitivity analyses that excluded the study with the largest sample did not significantly alter the findings. There were no differences in outcomes between the random-effects and fixed-effect models. There was no difference in uterine weight between robot-assisted and traditional laparoscopy groups. The authors stated there was no publication bias but inspection of funnel plots suggested that there may have been some missing data.

Authors' conclusions
Robot assisted laparoscopic hysterectomy was associated with shorter length of stay, fewer postoperative complications and fewer conversions to laparotomy compared to traditional laparoscopic hysterectomy. There were no differences in estimated blood loss or operative time.

CRD commentary
The review addressed a clear question. Inclusion criteria were specified for intervention and outcomes. Criteria for study design and patients were unclear. Several relevant databases were searched. It appeared that no attempts were made to identify unpublished material. Publication bias was assessed through visual inspection of the funnel plots, which suggested that there may have been some missing data. The search was restricted to studies English, which may have introduced some language bias. The authors stated that they followed the QUORUM statement but they did not explicitly state that they used appropriate methods to minimise reviewer error and bias. The design of included studies was not reported. It appeared that the quality of included studies was not assessed. Therefore, the reliability and validity of data used was unclear. Given the lack of information about study design, it was unclear whether it was appropriate to combine the studies in a meta-analysis. It was unclear whether or not suitable methods were used to combine continuous outcomes.

A lack of information about the quality and design of included studies and uncertainty regarding the suitability of analyses mean that the authors' conclusions should be treated with caution.

Implications of the review for practice and research
Practice: The authors stated that the results confirmed that robot-assisted laparoscopic intervention had less deleterious effects on hospital, society and patient stress and led to better quality of life.

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

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Bibliographic details
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.