Updated systematic review and meta-analysis of randomized clinical trials on the role of mechanical bowel preparation before colorectal surgery

Slim K, Vicaut E, Launay-Savary MV, Contant C, Chipponi J

CRD summary
This review concluded that there was a high level of evidence that any kind of mechanical bowel preparation should be omitted before colonic surgery, although the analysis did not confirm a harmful effect of mechanical bowel preparation. The authors’ conclusions seem reasonable and are likely to be reliable.

Authors’ objectives
To evaluate the role of mechanical bowel preparation in colorectal surgery and the influence of different preparation regimes on infection outcomes.

Searching
MEDLINE, the Cochrane Library and Scopus were searched up to January 2008, as well as the last six issues of major surgical journals, the proceedings of major meetings from 2004 and the reference lists of retrieved articles. Search terms were not reported. This search updated searches from an earlier review on the topic (see Publications of Related Interest). Based on the earlier publication, there were no language restrictions.

Study selection
Randomised controlled trials (RCTs) that compared mechanical bowel preparation with no mechanical bowel preparation before elective colorectal surgery were included. The primary outcome of interest was anastomotic leakage. Secondary outcomes were infectious complications (pelvic abscess, peritonitis, wound infection), overall surgical site infection, re-operation, extra-abdominal infectious complications, length of hospital stay and death.

The included studies used the following solutions: polyethylene glycol, sodium phosphate, mannitol or magnesium phosphate mechanical bowel preparation. The majority of trials defined the comparator as 'no additional bowel' or 'rectal cleansing'. Most trials were of adults, with the exception of one trial that also included children. All trials confirmed anastomotic leakage based on a clinically suspected leak.

Two researchers independently selected studies for inclusion.

Assessment of study quality
Trials were assessed for reporting of randomisation, allocation concealment, single blinding (double blinding was considered not feasible) drop-out and withdrawals. The maximum possible score was 5 points; trials with a score of 2 or less were classified as poor quality.

Validity assessment was undertaken independently by two researchers and disagreements were resolved through consensus.

Data extraction
Two researchers independently extracted data. The number of events for the outcomes of interest and the number randomised were extracted and the odds ratio (OR) and 95% confidence interval (CI) calculated. Authors were contacted for additional data where necessary.

Methods of synthesis
Trials were pooled in a meta-analysis using a Peto random-effects model. Statistical heterogeneity was assessed using the Q-statistic and I^2. Subgroup analyses were undertaken to assess the robustness of the results based on poor quality versus good quality studies; large (two trials of over 1,300 participants each) versus small trials; polyethylene glycol versus other solutions; and peritoneal versus infraperitoneal anastomosis. A funnel plot for the primary outcome was
visually inspected to assess for the possibility of publication bias.

Results of the review
Fourteen RCTs (n=4,859 patients) were included. Three RCTs had a quality score of 2 points and were classified as poor quality; the remaining trials scored 3 or, most commonly, 4 points. Excluding the two large trials of more than 1,300 participants each, sample size ranged from 47 to 380. Where reported, length of follow-up ranged from seven to 90 days.

Following mechanical bowel preparation, 4.02% of participants experienced anastomotic leakage compared with 3.44% of participants without mechanical preparation. There was no statistically significant difference in anastomotic leakage between the two groups (OR 1.12, 95% CI: 0.82 to 1.53, 14 trials). There was no statistically significant difference between groups for the other outcomes, except for overall surgical site infections, where there was a higher risk in the mechanical bowel preparation group (OR 1.40, 95% CI: 1.05 to 1.87, 14 trials). There was statistically significant heterogeneity in this analysis. The subgroup analyses did not substantially alter the results. It was not possible to undertake subgroup analysis of rectal surgery as, for the majority of trials, this was an exclusion criterion in the trial or data were not reported separately for this group.

The authors stated that visual inspection of the funnel plot did not suggest publication bias, but interpretation was limited by the small number of trials.

Authors’ conclusions
Although it did not confirm a harmful effect of mechanical bowel preparation, the analysis demonstrated a high level of evidence that any kind of mechanical bowel preparation should be omitted before colonic surgery.

CRD commentary
This review had clearly stated inclusion criteria and a number of relevant sources were searched for studies, including possible sources of unpublished data. Appropriate methods were used to reduce error and bias in the review processes.

Study quality was assessed and considered in the analysis. The approach to the analysis seemed appropriate and heterogeneity was assessed and investigated.

The authors' conclusions seem appropriate and are likely to be reliable.

Implications of the review for practice and research
Practice: The authors state that mechanical bowel preparation should not be used before colonic surgery.

Research: The authors stated that evaluation is required of the role of mechanical bowel preparation in rectal surgery.

Funding
Not stated

Bibliographic details

PubMedID
19212171

DOI
10.1097/SLA.0b013e318193425a
Original Paper URL

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Anastomosis, Surgical /adverse effects; Cathartics /administration & dosage /adverse effects; Colectomy /adverse effects; Colon /surgery; Humans; Postoperative Complications /etiology /prevention & control; Preoperative Care; Randomized Controlled Trials as Topic; Rectum /surgery; Surgical Wound Infection /etiology /prevention & control

AccessionNumber
12009104622

Date bibliographic record published
02/09/2009

Date abstract record published
19/05/2010

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.