Does purgative preparation influence the diagnostic yield of small bowel video capsule endoscopy? A meta-analysis
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CRD summary
This review found that purgative bowel cleansing before video capsule endoscopy (VCE) improved small bowel visualisation quality and increased the diagnostic yield of the examination, but did not affect the VCE completion rate. These conclusions are likely to be reliable, but should be interpreted with caution due to the failure to adequately assess study quality.

Authors' objectives
To determine the effects of bowel preparation method on diagnostic yield, small bowel visualisation quality, and video capsule endoscopy (VCE) completion rates.

Searching
PubMed (including MEDLINE) and EMBASE were searched to February 2008 and search terms were reported. Review articles and recently published editorials and references of retrieved studies were screened. Relevant conference proceedings were handsearched. The review was limited to English-language studies published as full articles or abstracts.

Study selection
Studies were eligible for inclusion if they were in adults, compared a purgative with a clear-liquids diet before the capsule was swallowed, and provided raw data on at least one of the following outcomes: diagnostic yield, small bowel visualisation quality, VCE completion rate, and VCE transit time (either gastric transit time or small bowel transit time). Studies that used simethicone or prokinetic bowel preparation were excluded. Included studies used the M2A or Pillcam SB (Given Imaging) video capsule.

Purgatives used in the included studies were polyethylene glycol and sodium phosphate. They were mainly administered the evening or day before the VCE, but in some studies the dosage was split, with some given the day before and the remainder given on the morning of the procedure. Control interventions included fasting for 8 to 12 hours with or without clear liquids for 12 to 24 hours, prior to the VCE.

Two reviewers independently assessed studies for inclusion and disagreements were resolved through discussion with a third reviewer.

Assessment of study quality
Studies were assessed according to the following criteria: prospective study; more than one examiner; examiners blind to preparation method; three or more grades for overall bowel cleansing; and evaluation of the entire small bowel. Studies were assigned one point for each item fulfilled giving a maximum possible score of five.

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

Data extraction
Two reviewers independently extracted data using a predefined form and disagreements were resolved through discussion with a third reviewer. Data were extracted as odds ratios (ORs) for dichotomous outcomes, and as effect sizes, means, or medians for continuous data.

Methods of synthesis
Pooled ORs and 95% confidence intervals (CIs) were estimated. Where data were homogeneous the Mantel-Haenszel fixed-effect model was used otherwise the DerSimomian and Laird random-effects model was used. Heterogeneity was
assessed using the Cochran Q test and $I^2$ statistic. Sensitivity analysis was conducted by repeating the meta-analysis excluding each study individually and by stratifying the analysis according to the following factors: study form (full length versus abstract), study design (prospective versus retrospective), and type of purgative used (polyethylene glycol versus sodium phosphate). Meta-regression was used to further investigate heterogeneity based on quality-related factors. Publication bias was assessed visually using funnel plots and statistically using the Egger test.

Results of the review
Twelve studies were included (1,162 participants). Six studies were randomised controlled trials, five were retrospective cohort studies, and one was a case-control study.

The diagnostic yield (OR 1.81, 95% CI 1.25 to 2.63; 5 studies) and proportion of patients with adequate or excellent/good small bowel visualisation quality (OR 2.11, 95% CI 1.25 to 3.57; 7 studies) were greater in patients who received a purgative preparation compared with those who received a clear-liquids diet, prior to VCE. There was little heterogeneity ($p=0.127, I^2=39.6$) among studies assessing diagnostic yield but strong evidence for those assessing small bowel visualisation quality ($p=0.011, I^2=59.6$%). Sensitivity analysis for these studies showed that significant differences between the two comparison groups remained when the analysis was restricted to RCTs ($p=0.022$), full paper publications ($p=0.008$), and sodium phosphate purgative use ($p=0.046$).

There was no difference between the two treatment groups in VCE completion rates (10 studies), VCE gastric transit times (7 studies), or small bowel transit times (8 studies). None of the included studies reported any clinically significant complications.

There was no statistically significant evidence of publication bias for any of the outcomes assessed ($p>0.05$).

Authors' conclusions
Purgative bowel cleansing before VCE improves the small bowel visualisation quality and increases the diagnostic yield of the examination, but does not affect the VCE completion rate.

CRD commentary
This review addressed a focused question supported by clearly defined inclusion criteria. The literature search was adequate, but restricted to published English-language studies, which could introduce language and publication bias, which was considered in the analysis. Appropriate steps were taken to minimise bias and errors in the selection of studies and extraction of data, but it is unclear whether these steps were also taken when assessing study quality. A formal quality assessment was conducted and did include some relevant items, but other items known to affect the validity of randomised controlled studies, such as randomisation and concealment of treatment allocation, were not considered. The reliability of the primary studies therefore remains unclear. The meta-analysis used appropriate methods and heterogeneity was assessed and investigated.

The authors' conclusions are likely to be reliable, but should be interpreted with caution due to the failure to adequately assess study quality.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that there was a need for good quality randomised controlled trials.

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None.

Bibliographic details
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.