Oesophageal Doppler-guided fluid administration in colorectal surgery: critical appraisal of published clinical trials
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CRD summary
This review evaluated the effectiveness of oesophageal Doppler-monitoring guided fluid administration in patients who underwent colorectal surgery. The authors concluded that the evidence was limited by wide variations in trial design. Potential for missing studies and the possible impact of reviewer bias may mean that this conclusion is not reliable.

Authors' objectives
To evaluate the effectiveness of oesophageal Doppler-monitoring (ODM) guided fluid administration in patients undergoing colorectal surgery.

Searching
MEDLINE, EMBASE and The Cochrane Library were searched for published articles. There were no language restrictions. Search dates were from 1966 to 2010. Key terms were reported. References lists of relevant articles and reviews were scanned for further studies.

Study selection
Randomised controlled trials (RCTs) of ODM-guided intraoperative fluid administration in patients who underwent colorectal surgery were eligible for inclusion.

All trials except one focused on patients who received colorectal surgery (two used laparoscopic procedures). A distinction between colonic and rectal procedures was made in three out of five trials. The median American Society for Anesthesiologists (ASA) score for patients was 2. One trial was conducted according to the Enhanced Recovery After Surgery (ERAS) protocol. Preoperative, intraoperative and postoperative management of patients varied widely. The primary outcomes of interest were hospital length of stay and cardiac output. Discharge criteria for the first of these outcomes was reported in two trials. Among the secondary outcomes were complications, intraoperative cardiac variables, blood transfusions, dietary outcomes, nausea and vomiting, quality of life and cytokine release.

It appeared that studies were selected by two reviewers and any disagreements were resolved with the additional involvement of two senior reviewers.

Assessment of study quality
Trial quality was assessed using the Jadad scale (maximum score of 5). Items assessed included randomisation, allocation concealment, blinding, power calculation and use of intention-to-treat data.

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

Data extraction
Data were extracted to enable presentation of direction of effect for the outcomes of interest.

The authors did not state how many reviewers carried out data extraction.

Methods of synthesis
A narrative synthesis was presented. Publication bias was assessed with a funnel plot.

Results of the review
Five trials \( (n=457\) participants, range 57 to 128\) were included in the review. Jadad scores ranged from 2 to 5. All trials provided detail on randomisation and power calculation. Four trials reported on use of blinding and intention-to-treat data. Two trials reported on allocation concealment.

Three trials \( (n=336)\) found that ODM-guided fluid administration was associated with decreased hospital length of stay; two of these trials \( (n=208)\) reported fluid-related complications. One trial \( (n=64)\) showed that ODM-guided colloid administration increased length of stay and complications. One trial \( (n=57)\) reported an increase in cardiac output as the primary outcome. Other secondary outcomes were reported.

There was no evidence of publication bias.

**Authors’ conclusions**

Evidence regarding use of Doppler-guided fluid administration in colorectal surgery was limited by heterogeneity in trial design.

**CRD commentary**

The review question was clear. Inclusion criteria were defined for all aspects apart from outcomes. The search strategy included relevant data sources. Attempts were made to minimise language bias. Publication bias was a possibility due to the restriction to published studies; this was assessed as having no impact, but the analysis was limited by the small number of included studies. An appropriate quality assessment tool was used to evaluate the included trials and results were reported clearly. Study selection appeared to include attempts to minimise reviewer error and bias; other parts of the review process were unclear in this respect. A narrative synthesis was appropriate given the wide variation among studies, but the absence of statistical test results limited any robust interpretation of the review findings.

The authors’ conclusion reflects the limited evidence presented, but potential for missing studies and the impact of possible reviewer bias may make this conclusion unreliable.

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

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that future studies should include records of postoperative fluid administration, evaluate the role of newer balanced colloid solutions and adopt a standardised protocol for use of blood transfusions in trials of colloid fluid administration. A well-designed RCT was needed to compare ODM-guided intraoperative fluid administration with intraoperative fluid restriction in patients with ASA scores of 2 or 3.

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