A systematic review of the efficacy of gum chewing for the amelioration of postoperative ileus

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CRD summary
This review concluded that there was favourable effect of gum chewing on time to flatus and defaecation in patients after colorectal surgery, but no significant effect on postoperative hospital stay. These conclusions should be interpreted cautiously given the small sample sizes of included trials and the possibility of publication and language biases.

Authors’ objectives
To assess the efficacy of gum chewing for the amelioration of postoperative ileus in patients after colorectal surgery.

Searching
The following databases were searched for English language studies from inception to June 2007: MEDLINE, EMBASE and the Cochrane Library. Search terms were reported. The ‘related articles’ feature of PubMed was used to identify additional studies. Reference lists of relevant publications were screened. Unpublished data or abstracts were excluded.

Study selection
Randomized controlled trials (RCTs) that compared gum chewing with a control treatment for the amelioration of postoperative ileus in patients after colorectal surgery were eligible for inclusion. The review outcomes were time to flatus, time to defaecation, and overall hospital stay.

Most of the included trials performed the open colectomies; one trial performed laparoscopic colectomies. All included trials administered gum chewing three times daily. Three trials used thoracic epidural analgesia for patients. It appeared that the control treatment in included trials was usual care; one trial used an acupressure bracelet as an additional sham control. The mean age of participants ranged from 54 to 68 years; most were male. Forty percent of trials included resections for benign or malignant disease; the remaining trials included resections for malignant disease only. Included trials were conducted in Japan, USA and the UK.

Three reviewers independently assessed studies for inclusion, with any disagreement resolved by discussion.

Assessment of study quality
The quality of trials was assessed using the criteria for randomisation, blinding, baseline comparability and intention-to-treat analysis.

Four reviewers independently performed validity assessment, with any disagreement resolved by discussion.

Data extraction
Data were extracted on the mean and standard deviation of relevant outcomes (for each trial arm) to calculate mean differences (MDs) and 95% confidence intervals (CIs).

The authors did not state how many reviewers performed data extraction.

Methods of synthesis
The included trials were combined in meta-analyses. Weighted mean differences (WMDs) with 95% confidence intervals were calculated. Statistical heterogeneity was assessed using $\chi^2$ and $I^2$ statistic. A random-effects model was used in the presence of marked heterogeneity ($I^2$ over 60%); a fixed-effect model was employed when there was limited heterogeneity ($I^2$ below 40%). Both models were used when there was moderate heterogeneity ($I^2$ between 40 and 60%).

Sensitivity analyses were conducted by excluding patients who underwent laparoscopic resection, as well as excluding Japanese studies (only for the outcome of postoperative hospital stay).
Subgroup analyses were conducted on different disease types of patients (benign disease versus malignant disease).

**Results of the review**

Five RCTs were included in the review (158 patients). Randomisation and baseline comparability were adequate for all trials, but none used double blinding. Allocation concealment was not adequate for all trials. All trials used intention-to-treat analyses.

Compared with control treatment, gum chewing was significantly associated with a shorter time to flatus (WMD = -19.3 hours, 95% CI -8.42 to -30.19; five RCTs) and a shorter time to defaecation (WMD = -29.67 hours, 95% CI -13.32 to -46.03; five RCTs). There was no significant difference in the duration of postoperative hospital stay between the two treatments. Moderate heterogeneity was observed in the outcome of time to flatus ($I^2=58.7\%$) and with substantial heterogeneity for the postoperative hospital stay outcome ($I^2=73.1\%$).

Sensitivity and subgroup analyses did not materially alter the results.

**Authors’ conclusions**

There was favourable effect of gum chewing on time to flatus and defaecation in patients after colorectal surgery, but no significant effect on postoperative hospital stay.

**CRD commentary**

The inclusion criteria of the review were clear. Relevant databases were searched. Efforts were made to find published studies, but not unpublished studies, increasing the potential for publication bias. The search was limited to studies in the English language, which may have increased the risk of language bias. Steps were made to minimise reviewer error and bias in the processes of study selection and validity assessment, but it was unclear whether data extraction was also performed in duplicate.

Appropriate criteria were used to assess trial quality; the included trials were generally of limited quality. Statistical heterogeneity was assessed and appropriate methods were used to pool the results. The authors' conclusions reflect the evidence presented. However, a degree of caution might be required in interpreting these conclusions given the small sample sizes of included trials and the possibility of publication and language biases.

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

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

**Research**: The authors stated that further well-designed trials are required to assess the effectiveness of gum chewing for the amelioration of postoperative ileus for patients who undergo colorectal surgery. These trials should include patients who are operated on using the generally accepted fast-track protocols and should critically evaluate the endpoints.

**Funding**

Not stated.

**Bibliographic details**


**PubMedID**

18292660

**DOI**

10.1159/000117822

**Original Paper URL**

http://content.karger.com/ProdukteDB/produkte.asp?Aktion=ShowAbstract& amp;ArtikelNr=000117822
**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Adult; Aged; Chewing Gum; Female; Gastrointestinal Motility; Humans; Intestinal Pseudo-Obstruction /etiology /therapy; Male; Mastication; Middle Aged; Postoperative Complications; Treatment Outcome

**AccessionNumber**
12008103614

**Date bibliographic record published**
03/02/2009

**Date abstract record published**
01/06/2011

**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.