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## Systematic review of peri-operative nutritional supplementation in patients undergoing pancreaticoduodenectomy

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### CRD summary

The review concluded that cyclical routine post-operative enteral nutrition appeared to be the optimal method of delivery and total parenteral nutrition was not beneficial. In view of the review's limitations (search, reporting, methods, validity assessment) and that part of the conclusion was based on one small, randomised controlled trial of unknown quality, the authors' conclusion may not be reliable.

### Authors' objectives

To evaluate the effects of peri-operative nutritional supplementation in patients undergoing pancreaticoduodenectomy.

### Searching

MEDLINE (1994 to November 2004) and EMBASE (1974 to 2004) were searched for studies reported in the English language; the search terms were reported.

### Study selection

#### Study designs of evaluations included in the review

Case reports and reviews were excluded; other than that no design inclusion criteria applied.

#### Specific interventions included in the review

Studies that evaluated nutritional supplementation were eligible for inclusion. The included studies compared total parenteral nutrition (TPN), enteral nutrition (EN) and immune-enhanced enteral nutrition (I-EN) with each other or no initial post-operative nutritional support; one study compared cyclical versus non-cyclical EN.

#### Participants included in the review

Studies in patients undergoing pancreaticoduodenectomy and studies of patients with upper gastrointestinal cancer that included some patients undergoing pancreaticoduodenectomy were eligible for inclusion. Where reported, the included studies were in patients with suspected malignancy and, apart from the cancer site for the patients with gastrointestinal cancer, no information about the patients was presented.

#### Outcomes assessed in the review

Studies that provided nutritional data were eligible for inclusion. The review assessed morbidity, mortality, complications, duration of hospital stay and various nutritional measures; pre-operative data (including the percentage of normal body weight lost before surgery and pre-operative albumen and jaundice) and duration of peri-operative nutritional support were also reported. The included studies used different definitions for post-operative complications and overall post-operative morbidity.

#### How were decisions on the relevance of primary studies made?

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

### Assessment of study quality

The authors did not state that they assessed validity.

### Data extraction

The authors did not state how the data were extracted for the review, or how many reviewers performed the data

extraction. Where possible, the percentage of patients and mean values of outcome measures were presented for each study.

## Methods of synthesis

### How were the studies combined?

The studies were grouped by study characteristics (patients undergoing pancreatic resection, patients undergoing resection of gastrointestinal cancers and cyclical versus non-cyclical EN) and combined in a narrative, with accompanying tables.

### How were differences between studies investigated?

Some differences between the studies were discussed in the text whilst others were apparent from the tables.

## Results of the review

Ten studies (n=1,264) were included: eight randomised controlled trials (RCTs; n=1,022), one observational study (n=62) and one retrospective study (n=180).

Studies in which all patients underwent pancreatic resection. TPN was associated with a higher mortality (based on two RCTs): the increase was not statistically significant in one study (6.7% versus 1.8% in the control group) and statistical significance was not reported in the other (5.9% versus 1.4% for EN and 2.8% for I-EN). TPN was associated with significantly higher overall morbidity compared with no nutritional support (45% versus 22.8%, p=0.02) in one RCT and with EN and I-EN (58.8% versus 43.5% and 33.8%, p=0.005) in another RCT. TPN was associated with a longer hospital stay compared with no TPN (mean stay 16 versus 14 days; one RCT) and EN or I-EN (18.8 versus 17.0 or 15.1 mean days, p<0.02; one RCT).

EN was associated with an increased rate of overall morbidity compared with no nutritional supplementation in one observational study (43.3% versus 28.1%, p not reported), but was associated with a lower morbidity rate in one retrospective study (65.3% versus 92.7%, p not reported). EN was associated with a shorter duration of hospital stay (13.9 versus 14.8 mean days, statistical significance not reported) compared with the control.

Studies in patients undergoing resection of gastrointestinal cancers. None of the studies reported outcome data separately for different types of surgery.

Cyclical versus non-cyclical EN.

Cyclical EN was associated with significantly fewer mean days to resumption of normal diet (12.2 versus 15.7, p=0.04) compared with continuous EN (one RCT, n=57), but there was no significant difference between treatments in the number of days of nasogastric intubation (p=0.82).

## Authors' conclusions

Cyclical routine post-operative EN appeared to be the optimal method of delivering nutritional support; routine TPN was not beneficial.

## CRD commentary

The review addressed a clear question; inclusion criteria for the study design and outcomes were broad. The search strategy was limited to English language reports in two electronic databases, which raises the possibility of missing studies and publication and language bias. The methods used to select studies and extract the data were not described, so it is not known whether any efforts were made to reduce reviewer errors and bias. Since study validity was not assessed, the results from these studies and any synthesis might not be reliable. The results from the individual studies were presented clearly, whereas the reporting of other study characteristics was limited. The narrative synthesis was appropriate given the variability among the included studies, but the presentation was limited. In view of the limited search, lack of reporting, limitations in review methods, lack of an assessment of validity, and basing the conclusion regarding the optimal effect of cyclical EN on one relatively small RCT of unknown quality, the authors' conclusion

may not be reliable.

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

Practice: The authors stated that the pre-operative nutritional status should be considered in patients undergoing pancreaticoduodenectomy and that these patients should be given cyclical EN post-operatively.

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

### **Bibliographic details**

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