Meta-analysis of parenteral nutrition versus enteral nutrition in patients with acute pancreatitis

Marik P E, Zaloga G P

CRD summary
This review compared the safety and clinical outcomes of enteral and parenteral nutrition in patients with acute pancreatitis. The authors concluded that the best available data from a small number of patients support the use of enteral nutrition. This was generally a well-conducted review and the authors' cautious conclusion reflect the limited evidence.

Authors' objectives
To compare the safety and clinical outcomes of enteral and parenteral nutrition in patients with acute pancreatitis.

Searching
MEDLINE (from 1966 to January 2004), EMBASE, the Cochrane Controlled Trials Register and the Cochrane Database of Systematic Reviews were searched for studies published in any language; the search terms were reported. Bibliographies of all selected articles and reviews were checked. Personal files were also searched and experts in the field were contacted.

Study selection
Study designs of evaluations included in the review
Only randomised controlled trials (RCTs) were eligible for the review.

Specific interventions included in the review
Studies that compared enteral with parenteral nutrition were eligible for the review. In the included studies, enteral nutrition was delivered through a nasojejunal tube that was placed endoscopically or radiographically.

Participants included in the review
Studies of patients who had been admitted to hospital with acute pancreatitis were eligible for the review. In the included studies, all patients had abdominal pain with raised serum amylase and lipase activity and were enrolled within 48 hours of hospital admission. The studies included patients with varying severity of pancreatitis (from mild to severe) and scored severity using the APACHE II score, Ransom score or IMRIE (Glasgow) score.

Outcomes assessed in the review
Studies were eligible for the review if they assessed any of the following as primary outcomes: number of infections, total number of non-infectious complications, number of surgical interventions, length of hospital stay and hospital mortality.

How were decisions on the relevance of primary studies made?
To identify relevant studies, two researchers independently conducted the searches. The literature search was conducted as an iterative process.

Assessment of study quality
The quality of the included trials was assessed according to the Jadad criteria. The authors did not state how many reviewers performed the quality assessment.

Data extraction
Two reviewers independently extracted the data using standardised forms. Any disagreements were resolved by discussion and, where necessary, by contacting the primary author. Outcome variables (infections, non-infectious complications, operative interventions, mortality and length of hospital stay) were either recorded or calculated using the intention-to-treat principle (i.e. based on all patients randomised).

Methods of synthesis
How were the studies combined?
The specified outcome variables from the included studies were combined in a meta-analysis using a random-effects model. Pooled relative risks (RRs) or weighted mean differences (WMDs) were calculated, along with 95% confidence intervals (CIs).

How were differences between studies investigated?
Statistical heterogeneity was tested for using the chi-squared test, with a P-value of less than 0.05 as the limit for significance. Potential sources of differences between the studies were discussed in the paper.

Results of the review
Six RCTs were included in the review. All trials were of small numbers of patients (total n=263).

Study quality was generally low: 4 trials scored less than 3 out of 5 points. None of the trials were blinded.

Infections (6 studies, n=163): there was a statistically significantly lower risk of infections in patients who received enteral nutrition than in those who received parenteral nutrition (RR 0.45, 95% CI: 0.26, 0.78, P=0.004). There was no statistically significant heterogeneity (P=0.59).

Non-infectious complications (5 trials): there was no statistically significant difference in the risk of non-infectious complications in patients who received enteral nutrition and those who received parenteral nutrition (RR 0.61, 95% CI: 0.31, 1.22, P=0.16).

Surgical interventions (4 trials): there was a (just) statistically significant lower risk of infections in patients who received enteral nutrition compared with those who received parenteral nutrition (RR 0.48, 95% CI: 0.23, 0.99, P=0.05). There was no statistically significant heterogeneity (P=0.89).

Hospital mortality (6 studies): there was no statistically significant difference in hospital mortality between the enteral nutrition and parenteral nutrition groups (RR 0.66, 95% CI: 0.32, 1.37, P=0.3).

Length of hospital stay (6 trials): this was statistically significantly shorter in the group of patients who received enteral nutrition (WMD 2.9 days, 95% CI: 1.6, 4.3, P=0.001). Statistically significant heterogeneity was found (P=0.0056).

Authors’ conclusions
The best available data from generally poor-quality studies with few patients did not support the use of parenteral nutrition in patients with acute pancreatitis. Compared with enteral nutrition, parenteral nutrition increased the risks of infection and the requirement for surgical interventions in these patients.

CRD commentary
This review addressed a very specific and clearly defined research question. The literature search was thorough, experts in the field were contacted, and attempts were made to reduce publication and language bias. It is therefore unlikely that important studies were missed. The appropriateness of the review methods means that reviewer bias is likely to have been minimised. The methods of analysis were also appropriate. However, the results of the test for heterogeneity and meta-analysis graphs were not reported for every pooled result. The authors’ cautious conclusion reflects the limited evidence.
Implications of the review for practice and research
Practice: The authors recommended that enteral nutrition should be the preferred route of nutritional support in patients with acute pancreatitis.

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

Bibliographic details

PubMedID
15175229

DOI
10.1136/bmj.38118.593900.55

Original Paper URL
http://bmj.bmjjournals.com/cgi/content/full/328/7453/1407

Other publications of related interest
This additional published commentary may also be of interest. Review: enteral nutrition reduces infections, need for surgical intervention, and length of hospital stay more than parenteral nutrition in acute pancreatitis. Evid Based Med 2005;8:19.

Indexing Status
Subject indexing assigned by NLM

MeSH
Acute Disease; Communicable Diseases /etiology; Enteral Nutrition /methods; Hospital Mortality; Humans; Length of Stay; Pancreatitis /complications /mortality /therapy; Parenteral Nutrition /methods; Randomized Controlled Trials as Topic; Treatment Outcome

AccessionNumber
12004008500

Date bibliographic record published
28/02/2006

Date abstract record published
28/02/2006

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.