Influence of enteral versus parenteral nutrition on blood glucose control in acute pancreatitis: a systematic review

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CRD summary
This well conducted and clearly reported review found that enteral nutrition was associated better blood glucose control compared to parenteral nutrition in patients with acute pancreatitis who were previously non-diabetic. The conclusions are likely to be reliable.

Authors' objectives
To compare the effects of enteral and parenteral nutrition on blood glucose control in patients with acute pancreatitis.

Searching
MEDLINE, EMBASE and Cochrane Central Register of Controlled Trials were searched to December 2006. Search terms were reported. Reference lists of selected articles and relevant review articles were screened to identify additional studies. No language restrictions were applied.

Study selection
Randomised controlled trials that compared enteral nutrition (defined as nasogastric or nasojejunal delivery of liquid nutritional formula not supplemented with immune enhancing ingredients) with parenteral nutrition in patients with acute pancreatitis were eligible for inclusion. Included studies had to report at least three of these outcomes: incidence of hyperglycaemia; need for insulin therapy; total infectious complications; and in-hospital mortality. Parenteral nutrition feeding formula, where reported, consisted of various combinations of dextrose solution, amino acid solution, fat emulsion, Kabiven PI, vitamins and minerals. Enteral nutrition feeding formula was elemental, semi-elemental or polymeric. Feeding was started at different time points ranging from <24 hours of admission to >96 hours of admission. Most studies were restricted to non-diabetic patients with severe acute pancreatitis. Two studies also included patients with mild pancreatitis.

Two reviewers independently selected studies for inclusion. Disagreements were resolved through consensus.

Assessment of study quality
Studies were assessed for methodological quality using the Jadad scale (which assigns studies with a score of 0 to 5). The nature of the interventions meant it was impossible for studies to be blinded, so the maximum possible score was 3. Additional criteria, allocation concealment, blinding of outcome assessment and completeness of data were also assessed. The authors did not state how many reviewers performed the validity assessment.

Data extraction
Two reviewers extracted data on number of events for each endpoint. Disagreements were resolved through consensus.

Methods of synthesis
Pooled relative risks were calculated using a random-effects models together with 95% confidence intervals. Heterogeneity was assessed using the I^2 statistic and values greater than 20% were considered as providing strong evidence of heterogeneity. Publication bias was assessed using funnel plots.

Results of the review
Six randomised controlled trials (n=264) were included. Four studies scored 3 on the Jadad scale; two studies scored 2. None of the studies were double blinded. Only two studies reported adequate concealment of allocation. Four studies reported appropriate randomisation.

Enteral nutrition resulted in a decreased need for insulin therapy (six randomised controlled trials, relative risk=0.41, 95% confidence interval: 0.24, 0.70, p=0.001, I^2=15%), incidence of hyperglycaemia (three randomised controlled
trials, relative risk=0.53, 95% confidence interval: 0.29, 0.98, p=0.04, $I^2=22\%$), total infectious complications (six randomised controlled trials, relative risk=0.47, 95% confidence interval: 0.26, 0.85, p=0.01, $I^2=14\%$) and in-hospital mortality (six randomised controlled trials, relative risk=0.60, 95% confidence interval: 0.19, 1.88, p=0.38, $I^2=75\%$) compared to parenteral nutrition. Findings for need for insulin therapy and infectious complications remained similar when only patients with severe pancreatitis were considered, but enteral nutrition resulted in a statistically significant reduction in mortality (relative risk=0.32, 95% confidence interval: 0.11, 0.98, p=0.04, $I^2=9\%$).

There was no evidence of publication bias.

**Authors’ conclusions**

Enteral nutrition was associated with improved blood glucose control when compared to parenteral nutrition in patients with acute pancreatitis who were previously non-diabetic.

**CRD commentary**

This was a well-conducted review that was reported clearly. The review question was focused and supported by clearly defined inclusion criteria. The literature search was adequate. No explicit attempts were made to locate unpublished studies, but publication bias was assessed in the review and no evidence found. Appropriate steps were taken to minimise bias in the selection of studies and extraction of data, but it is unclear whether such steps were also taken for the quality assessment. A quality assessment was undertaken using appropriate criteria and the results presented clearly. Results were reported in tables and forest plots and the meta-analysis was appropriate. The authors’ conclusions were supported by the results presented and are likely to be reliable.

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

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

Research: The authors stated that future trials should consider the role of hyperglycaemia in patients with acute pancreatitis supported by artificial nutrition.

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