Effectiveness of a multidisciplinary total parenteral nutrition team in the hospital setting

Fernandez R, Griffiths R, Naylor C J

CRD summary
The review investigated the effectiveness of a multidisciplinary total parenteral nutrition (TPN) team in the hospital setting. The authors concluded that the general effectiveness of the TPN team has not been conclusively demonstrated. Although many results favoured the management by a team, the cautious conclusion reflects the evidence level and diverging results taking all evaluated outcomes into account.

Authors' objectives
To review the effectiveness of multidisciplinary total parenteral nutrition (TPN) teams for adult hospitalised patients.

Searching
CINAHL, MEDLINE, Biomedical Collection, Nursing Collection, EMBASE and the Cochrane Library were searched; details of the search strategy were provided. Searches of reports of expert committees, guidelines, bibliographies of retrieved studies, and the Australian Journal of Nutrition and Dietetics were also conducted. The Joanna Briggs Institute for Evidence Based Nursing and Midwifery, the Cochrane Collaboration, experts, company representatives, the British Association for Parenteral and Enteral Nutrition, and the Australasian Society for Parenteral and Enteral Nutrition were contacted for details of further published work or work in progress.

Study selection
Study designs of evaluations included in the review
Randomised and non-randomised controlled trials were eligible for inclusion. Studies with concurrent and historic controls were included in the review.

Specific interventions included in the review
Studies that compared the administration of TPN by a multidisciplinary team with administration by an unidisciplinary team were eligible. A multidisciplinary team was defined as at least two different health professionals. Studies where the patients were prescribed only intravenous maintenance fluids or received intradialytic parenteral nutrition were not eligible.

Participants included in the review
Studies of adult hospitalised patients (16 years or older) who were using TPN were eligible. In the included studies, the patients were aged from 26 to 93 years (mean 59.2) and the duration of TPN ranged from 7.1 to 26 days. TPN was administered using a central or peripheral venous catheter.

Outcomes assessed in the review
The primary outcomes considered in the review were the incidence and type of catheter-related complications, the incidence of metabolic and electrolyte abnormalities, the provision of nutritional requirements, and the number of patients whose nutritional goals were met.

The secondary outcomes were the cost-effectiveness of nutritional support teams and physician compliance with team recommendations. Objective and subjective measures were eligible.

How were decisions on the relevance of primary studies made?
Two reviewers independently screened titles and abstracts of potentially relevant studies. Two reviewers made decisions pertaining to the full paper and resolved any discrepancies by discussion and consultation with a third reviewer.
Assessment of study quality

The authors assigned a quality score using a tool developed by the review team. The tool assessed the method of sample selection, the description of the inclusion and exclusion criteria, the description of the members of the multidisciplinary TPN team, the baseline comparability of the groups, the description of the method used to assess adverse outcomes, the description of withdrawals and drop-outs, and the description of the method of statistical analysis. The review used the mean quality score of the identified studies as the threshold for defining studies of adequate quality. Two reviewers independently assessed the quality of the included studies. A mean quality score and the rater agreement was presented. However, the authors also stated that any discrepancies were resolved by discussion.

Data extraction

Two reviewers independently extracted the data using a standardised form developed by the review team, which a third reviewer cross-checked. Any discrepancies were resolved by discussion. The authors generally reported the percentages of the outcomes in question (e.g. percentage of complications) for both groups and the results of a test for significant differences between groups from an individual study.

Methods of synthesis

How were the studies combined?
The results were synthesised in a narrative review, grouped according to the outcome of interest.

How were differences between studies investigated?
The review compared the characteristics of the studies and linked study characteristics with diverging results.

Results of the review

Eleven studies (n=1,044) were included in the review: all were of a non-randomised design. Fours studies used concurrent controls, while seven used historical controls.

Five studies were excluded as they scored below the mean quality score of the identified studies; this left 11 eligible studies.

Seven studies reported catheter-related complications addressing mechanical or septic complications. All 6 studies that addressed mechanical complications reported a higher incidence of complications in patients under the management of physicians, compared with patients managed by a TPN team. Of the 7 studies that investigated catheter-related sepsis, five reported a reduction and two an increase in patients managed by a team.

Ten studies addressed the incidence of metabolic and electrolyte abnormalities. In four of the 5 identified studies that reported the incidence of total metabolic and total electrolyte abnormalities, patients managed by a team experienced fewer abnormalities; the other study found no statistically significant difference for this outcome.

All 5 studies addressing nutritional requirements reported more over- and underfeeding for patients not managed by TPN teams.

Two of 4 studies reported that patients managed by a team were more likely to be fed by the most appropriate route; the results of the other 2 studies were unclear.

Physicians complied with at least 50% of the recommendations made by the TPN team (based on 2 studies).

Cost information

Management by a TPN team led to a reduction in costs (2 studies).

Authors' conclusions
The general effectiveness of the TPN team has not been conclusively demonstrated.

**CRD commentary**
The review addressed a clear research question. The authors employed extensive searches to identify published and unpublished studies that could inform the review, thus minimising publication bias. The search was not restricted to English language papers; with the exception of two potentially relevant Japanese studies, foreign language papers were included in the review. The review provided well-structured study details and results. The review process was well documented, and strategies were used to minimise bias and errors in the study selection and data extraction processes. The authors assessed the quality of the studies thoroughly. The mean quality score of the included studies was used as a threshold for inclusion, and 5 relevant studies were subsequently excluded. Inter-rater agreement for the quality tool was reported.

The decision not to statistically pool the data was appropriate, as the definitions and measures of the outcomes differed in the individual studies. The authors' cautious conclusion takes the evidence level and diverging results into consideration.

**Implications of the review for practice and research**
Practice: The authors did not state any immediate implications for practice.

Research: The authors stated that further research should define roles and responsibilities of TPN team members; consider the composition of an ideal TPN team; evaluate patient outcomes when nutritional management is solely with a TPN team; use appropriate sample sizes; provide well-defined follow-up periods; undertake economic evaluations; and align outcomes with established criteria and guidelines.

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