Percutaneous endoscopic gastrostomy (PEG): feeding in the enteral nutritional of dysphagic stroke patients
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Authors' objectives
To ascertain whether endoscopic feeding is more effective than nasogastric tube feeding (NGT) in stroke patients who require enteral feeding; in particular, with regard to mortality, morbidity and health-related quality of life.

Searching
The following databases were searched in July 1998 (starting dates unclear) for reviews and primary studies: MEDLINE, the Science Citation Index, EMBASE, DARE, the Cochrane Database of Systematic Reviews, the Cochrane Controlled Trials Register, ISI Proceedings, NHS EED, HTA and the National Research Register. The search terms used were provided in the manuscript. Additional material was obtained by handsearching Drugs and Therapeutics Bulletin (1996 and 1997), following-up citations from reference lists, and through personal contacts.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were used to compare the outcome of PEG versus NGT, whilst case studies of PEG provided further information on procedure-related mortality rates. Small case-series were excluded. Where specified, the duration of the included RCTs ranged from 28 days to 6 weeks, and the mean length of follow-up for the case series ranged from 152 to 321 days (median: 53 to 98).

Specific interventions included in the review
Percutaneous endoscopic gastrostomy (PEG) was compared with NGT.

Participants included in the review
Stroke patients with persistent dysphagia who required enteral feeding were included, as were patients with dysphagia resulting from conditions other than stroke. Studies which included patients who had open as well as endoscopic gastrostomies were excluded. The duration of dysphagia within the included trials ranged from 8 days to at least 4 weeks (the duration was not stated in one trial). The reasons for dysphagia were neurological (including stroke), surgical or ENT (ear, nose, throat). In all of the included case series, the dysphagia was due to neurological conditions.

Outcomes assessed in the review
The following outcomes were assessed: mortality and survival; procedure-related mortality and complications; the patients' health-related quality of life; the patients' and carers' preferences; and the volume of food delivered.

How were decisions on the relevance of primary studies made?
Reviews and primary studies with relevant subject matter were identified by inspection of the titles and abstracts, and by obtaining the papers where necessary. It was not stated how many reviewers were involved in this process.

Assessment of study quality
The studies were assessed according to the criteria described by Jadad et al. (see Other Publications of Related Interest no.1) and Guyatt et al. (see Other Publications of Related Interest no.2). The following criteria were recorded: whether a power calculation was reported; the proportion of eligible patients randomised; the method of randomisation; the concealment of randomisation; blinding; and the reporting of drop-outs, crossovers and losses to follow-up. The important features relating to trial design were extracted by two reviewers, and any differences were discussed and reconciled.
Data extraction
Two reviewers extracted the data from the RCTs, and any differences were discussed and reconciled. Only one reviewer extracted the data from the case series.

The following data were extracted from the RCTs and reported in tabular format: details about the entry criteria; dysphagia definition; exclusion criteria; setting; the number of participants in the trial; the patients' characteristics; trial duration; treatment failure; the number of tube insertions; insertion time; mortality; the duration of feeding; weight gain; serum albumin concentration; patient or nurse preference; patient fixation; discharge rates; complications; and natural history of dysphagia.

The following data were extracted from the case series and reported in tabular format: details of study design; the number and the characteristics of the participants; the number of days between stroke and PEG insertion; criteria for PEG insertion; the duration of follow-up; results; and comments.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative summary.

How were differences between studies investigated?
Differences between the included studies were discussed in a narrative summary.

Results of the review
Three non-blinded RCTs (160 patients) and 8 case series (1,053 patients) were included.

It was considered that the patient populations in the RCTs were so different that the trial results could not be pooled.

Two trials included some stroke patients, the third included solely stroke patients. The evidence indicated that PEG feeding was more efficient than NGT feeding, and was more acceptable to patients who were able to express a preference. In one small trial (n=30), PEG feeding was associated with a reduced risk of death of 0.3 at 6 weeks after insertion, in patients who had persistent dysphagia at 14 days post-stroke. The RCTs did not provide any useful evidence of the impact of PEG feeding, compared with NGT feeding, on mortality in stroke patients with more long-standing dysphagia. Some case series reported procedure-related mortality rates for PEG of up to 4%. One death in one RCT may have been related to the PEG procedure.

Cost information
Compared to NGT feeding, PEG feeding was associated with health gains including improved patients' well-being and possibly earlier discharge. There were small differences in the resource implications of PEG compared to NGT, principally that PEG required the use of more senior staff.

Authors' conclusions
When compared with NGT feeding, PEG feeding of dysphagic stroke patients was associated with small increases in patient well-being and small differences in resource use. It is unknown whether enteral feeding of stroke patients has any impact on survival without severe disability. Trials in progress may provide further information.

CRD commentary
This appeared to be a well-conducted review. The inclusion and exclusion criteria were defined clearly. However, the authors noted that some smaller case series were excluded, but did not state what they considered to be small and how this decision was made.

The search strategy was fairly comprehensive although the start dates for the database searches were not provided. No
attempt was made to locate unpublished data and publication bias cannot be ruled out. Information about the methodological review process was presented, although it was not reported how many reviewers were involved in assessing the relevance of the studies identified. The validity of the included trials was assessed. Relevant details of primary studies were presented in tabular format and, in view of the differences reported between the included trials, a narrative summary of the results was appropriate.

The authors’ conclusions appear to follow from the results.

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

**Practice:** The authors state that given the small resource difference and the patients’ and nurses’ preference for PEG, the decision whether to use NGT or PEG feeding should be made by clinicians, carers and patients, who should be aware that there have been procedure-related deaths.

**Research:** The authors state that the results of the single small RCT, which found that early PEG feeding was associated with a reduction in mortality, needs to be confirmed by further research. They also noted that the impact of longer-term mortality and morbidity has not been adequately evaluated in RCTs. However, they identified two RCTs in progress that will address some of the uncertainties around the benefits of enteral feeding in stroke patients, and the use of PEG versus NGT in dysphagic stroke patients.

**Bibliographic details**

**Original Paper URL**

**Other publications of related interest**

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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.