Complications following gastrostomy tube insertion in patients with head and neck cancer: a prospective multi-institution study, systematic review and meta-analysis

Grant DG, Bradley PT, Pothier DD, Bailey D, Caldera S, Baldwin DL, Birchall MA

CRD summary
The authors concluded that rates of major complications were higher after radiologically inserted gastrostomy than percutaneous endoscopic gastrostomy in patients with head and neck cancer. Lack of assessment of study quality and lack of information about confounding factors (such as patient characteristics and clinicians’ expertise) meant that the conclusions may not be reliable.

Authors' objectives
To assess complication and mortality rates in patients with head and neck cancer who underwent gastrostomy tube insertion.

This abstract refers only to the systematic review contained in the paper.

Searching
MEDLINE, EMBASE, CINAHL, The Cochrane Library, Cochrane Central Register of Controlled Trials (CENTRAL), Centre for Reviews and Dissemination (CRD) databases and Clinical Evidence were searched for studies published in English. Search terms were reported. Search dates varied and spanned 1950 to October 2008. Reference lists were screened.

Study selection
Studies that reported outcomes following insertion of a gastrostomy tube in patients with head and neck cancer or other aerodigestive tract tumours were eligible for inclusion. Studies had to evaluate radiological fluoroscopic or endoscopic gastrostomy methods and had to clearly report complications for each gastrostomy technique.

The review evaluated percutaneous endoscopic gastrostomy (PEG) and radiologically inserted gastrostomy (RIG). The review assessed fatalities and major and minor complications. Major complications included: procedure-related mortality; repeat procedure; second puncture required for gastrostomy; bowel perforation, gastrointestinal haemorrhage, gastrocutaneous fistula, intra-abdominal or peristomal abscess formation and peritonitis that required surgery; stoma complications; post-procedure aspiration and pneumonia; and wound infection that required systemic antibiotics. Complications were classified as minor if they were self-limiting or required minimal intervention.

The authors stated neither how papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The number of fatalities, major and minor complications, and failures to insert gastrostomy were extracted for each study.

Data were extracted by one reviewer and independently verified by two other reviewers.

Methods of synthesis
Heterogeneity was assessed informally by comparing event rates and statistically using funnel plots and the fail-safe-N test. Weighted mean event rates were calculated when heterogeneity was not significant (p>0.05). Pooled event rates and 95% confidence intervals (CI) were presented.
Results of the review

Twenty-seven studies were included (n=1,281 PEGs and 1,098 RIGs).

Fatality event rates were 2.2% (95% CI 1.4% to 3.4%) following PEG and 1.8% (95% CI 1.0% to 3.2%) following RIG.

Major complication event rates were 7.4% (95% CI 5.9% to 9.3%) following PEG and 8.9% (95% CI 7.0% to 11.2%) following RIG.

Minor complication event rates were 19.5% (95% CI 17.1% to 22.1%) following PEG and 22.1% (95% CI 19.6% to 24.8%) following RIG.

No significant heterogeneity was detected for any of the analyses.

Authors' conclusions

Major complication rates were higher after radiologically inserted gastrostomy than after percutaneous endoscopic gastrostomy in patients with head and neck cancer, but the optimal gastrostomy technique remained uncertain.

CRD commentary

The review question was clearly stated and inclusion criteria were appropriately defined. Several relevant sources were searched, but no attempts were made to minimise publication and language biases. Methods were used to minimise reviewer error and bias in the extraction of data, but it was not clear whether similar steps were taken in study selection. Study validity was not assessed, but the authors acknowledged the potential for reporting bias in case series and the lack of information about reasons for selecting PEG or RIG. Lack of information about patient characteristics and clinicians' expertise meant that the generalisability of results was unknown. Appropriate methods were used for the meta-analyses. Heterogeneity was assessed and none was found. Funnel plots were not presented. Conclusions on the relative effect of different gastrostomy techniques were not based on direct comparisons and may not be reliable. Conclusions about the uncertainty of the optimal gastrostomy technique appeared to reflect limited evidence from potentially biased observational studies. Lack of study quality assessment and lack of information about confounding factors (such as patient characteristics and clinicians' expertise) meant that the conclusions about the relative effects of different procedures may not be reliable.

Implications of the review for practice and research

Practice: The authors stated that physicians who referred patients with head and neck cancer for gastrostomy needed to carefully consider the seriousness of complications associated with gastrostomy.

Research: The authors stated that a well-designed randomised controlled trial would be required to determine the optimal gastrostomy technique for patients with head and neck cancer. Future studies should carefully consider the gastrostomy technique and selection of patients, and take account of newer gastrostomy methods.

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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.