Cost-effectiveness of palliation of unresectable esophageal cancer
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to compare the cost-effectiveness of self-expandable stents, brachytherapy, and neodymium-doped yttrium aluminium garnet laser in the palliation of unresectable oesophageal cancer. The authors concluded that brachytherapy had the highest probability of being cost-effective. The methodology was good and clearly reported. The authors' conclusions appear to be appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to compare the cost-effectiveness of three commonly used strategies for the management of patients with dysphagia due to unresectable oesophageal cancer.

Interventions
The interventions were self-expandable stent, brachytherapy and neodymium-doped yttrium aluminium garnet laser.

Location/setting
USA/secondary care.

Methods
Analytical approach:
A decision analytic model populated with data from the literature was used to compare the cost-effectiveness of the three interventions. The time-horizon was nine months. The authors stated that the perspective of the third-party payer was adopted.

Effectiveness data:
The evidence came from a literature review of the MEDLINE database and details of the search strategy and inclusion criteria were reported. Randomised controlled trials (RCTs) were used to obtain the effectiveness data, but further details of the primary sources (study population, follow-up, etc.) were not reported. The primary health outcome was the probability of treatment success, which was defined as an improvement in swallowing function. Many additional parameters related to survival probability and treatment complications were also considered.

Monetary benefit and utility valuations:
None.

Measure of benefit:
Therapy efficacy was the measure of benefit. This was defined as the improvement in dysphagia or swallowing function. Dysphagia was assessed using a five-point scale that ranged from normal swallowing (0) to complete failure to swallow (4).

Cost data:
The economic analysis included the costs of interventions (equipment costs and professional costs), stents, and treatment of complications. These costs were derived from official national sources (Medicare) and were based on diagnosis-related group (DRG) data. Costs were reported in US dollars ($), but the price year was not explicitly reported.
Analysis of uncertainty:
A univariate sensitivity analysis and a probabilistic analysis (using Monte Carlo simulation) were carried out to investigate whether the base-case findings were robust. The probability distributions assigned to the model parameters were reported. Cost-effectiveness acceptability curves were presented, and the expected value of perfect information (EVPI) was calculated.

Results
The average cost per patient treated was $3,068 with laser, $4,177 with brachytherapy, and $5,411 with stent. The average probability of improvement in swallowing function was 0.81 with laser, 1.06 with brachytherapy, and 0.97 with stent.

In an incremental analysis, stent was dominated as it was more expensive and less effective than brachytherapy. When brachytherapy was compared with laser it resulted in an incremental cost-effectiveness ratio of $4,400.

One-way sensitivity analysis showed that these findings were only sensitive to the cost of the stent. The probabilistic sensitivity analysis indicated that at a willingness-to-pay (WTP) under $3,201, laser was the most cost-effective strategy, but positive Net Health Benefit (NHB) would only occur at a WTP of over $4,448. At WTP thresholds that resulted in positive NHBs, brachytherapy had the highest probability of being cost-effective.

Authors' conclusions
The authors concluded that, depending on the WTP, brachytherapy was the preferred strategy in terms of cost-effectiveness for the management of patients with dysphagia due to unresectable oesophageal cancer.

CRD commentary
Interventions:
The interventions were reported clearly. The authors compared interventions that were commonly used in their setting for the management of patients with unresectable oesophageal cancer.

Effectiveness/benefits:
The effectiveness data were derived from a literature review, the relevant details of which, were reported. Only RCTs were used as sources of data, and potentially these have a high level of internal validity, given their design. However, with the exception of the design, no other characteristics of the primary studies were reported, which makes it difficult to objectively assess the validity of the primary sources. The benefit measure was directly derived from the RCTs, but the use of a disease-specific measure of benefit does not allow cross-disease comparisons to be made.

Costs:
The cost analysis reflected the perspective in terms of both the data and their sources. The costs and quantities were not presented separately and costs were reported as macro-categories due to the use of DRG data. The price year was not reported, which will hinder future reflation exercises for other time periods.

Analysis and results:
The costs and benefits were clearly reported. The synthesis of costs and benefits was appropriately performed with the use of incremental analysis. The authors performed exhaustive sensitivity analyses, including deterministic and probabilistic sensitivity analysis and EVPI, which measured, amongst other things, the maximum potential value of undertaking future research. Overall, the level of reporting was good. The results of the base-case and the sensitivity analyses were adequately reported. The authors compared their results with those of other studies and discussed some of the differences. They also reported some limitations to their study.

Concluding remarks:
Overall, the methodology was good and transparently reported. The authors' conclusions appear to be appropriate.

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