A cost-effectiveness analysis of positron emission tomography-computed tomography surveillance versus up-front neck dissection for management of the neck for N2 disease after chemoradiotherapy

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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
This study examined the cost-effectiveness of positron emission tomography (PET) - computed tomography (CT) scanning for the management of patients who had oropharyngeal cancer (N2 disease) and had received definitive chemoradiotherapy. The authors concluded that PET-CT surveillance after definitive chemoradiotherapy for all patients was the most cost-effective strategy, compared with early neck dissection. There were some methodological limitations and the data sources were not fully described; caution is required when interpreting the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study examined the cost-effectiveness of positron emission tomography (PET) - computed tomography (CT) scanning for the management of patients who had oropharyngeal cancer of the neck (N2 disease) and who had received definitive chemoradiotherapy.

Interventions
Four strategies were considered: PET-CT scan; neck dissection and physical examination; dissection, examination, and CT scan; and dissection, examination, and PET-CT scan. All patients with a positive PET-CT scan were assumed to undergo neck dissection. Surveillance took place every three months for one year after treatment completion.

Location/setting
USA/hospital.

Methods
Analytical approach:
The analysis was based on a decision model, with a one-year time horizon. The perspective was not explicitly stated.

Effectiveness data:
A literature search was carried out to identify the clinical inputs for the model. The recurrence rates were key inputs for the analysis; some assumptions were needed.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
The proportion of patients who were free from disease in the neck was the summary benefit measure.

Cost data:
The economic analysis included the costs of the scans, neck dissection, and office visits. These costs were from national databases, which included Medicare reimbursement rates and the US Agency for Healthcare Research and Quality average costs. All costs were in US dollars ($) and the price year was 2008.
Analysis of uncertainty:
Not investigated.

Results
The expected costs were $14,492 with PET-CT scan, $36,925 with dissection and examination, $38,450 with dissection and examination plus CT scan, and $48,227 with dissection and examination plus PET-CT scan.

The proportion of patients free from disease was 0.986 with PET-CT scan, 0.992 with dissection and examination, 0.992 with dissection and examination plus CT scan, and 0.992 with dissection and examination plus PET-CT scan.

Both dissection and examination plus CT, and dissection and examination plus PET-CT were dominated, as they were equally effective and more expensive than dissection and examination alone. The incremental cost per additional patient free of disease after one year for dissection and examination over PET-CT alone was $3,854,397.

Authors’ conclusions
The authors concluded that PET-CT surveillance after definitive chemoradiotherapy for all patients was the most cost-effective strategy, compared with early neck dissection.

CRD commentary
Interventions:
Appropriate comparators were selected and they included the available surveillance strategies for the patient population.

Effectiveness/benefits:
No information on the methods and conduct of the literature review was provided; the databases searched and the inclusion and exclusion criteria were not reported. The methods used in the data sources were not given, meaning the clinical data were not transparently reported. The proportion of patients who were free of disease in the neck was an intermediate benefit measure, which only partly assessed the impact of the interventions on the patients’ health. It also makes comparisons with the benefits of other health care interventions difficult.

Costs:
The perspective was not explicitly reported, but the categories of costs and their sources indicate a payer’s perspective. Typical US databases were selected for the costs of hospital procedures and other items, but the resource quantities and unit costs were not presented separately and few details were given. The costs were treated deterministically and not varied. The price year was reported allowing reflation exercises. A short time-horizon was used and no discounting was required. It was unclear whether the inclusion of long-term costs might have changed the conclusions.

Analysis and results:
The results were clearly presented. An incremental approach was used to synthesise the costs and benefits of the strategies. The uncertainty was not investigated; no sensitivity analyses were performed. The authors acknowledged some limitations of their analysis, such as the limited time horizon, the application of their results only to patients with N2 disease, and the lack of data for the clinical inputs. The transferability of the results was not discussed and the findings should be considered specific to the authors’ setting.

Concluding remarks:
There were some methodological limitations and the data sources were not fully described; caution is required when interpreting the authors’ conclusions.

Funding
No funding received.

Bibliographic details