Primary surgery versus chemoradiation in the treatment of IB2 cervical carcinoma: a cost effectiveness analysis

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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 assessed the cost-effectiveness of radical hysterectomy and pelvic lymphadenectomy with tailored adjuvant therapy (RH-TA) compared with primary chemoradiation for the treatment of patients with non-metastatic, International Federation of Gynecology and Obstetrics stage IB2, cervical cancer. The authors concluded that RH-TA was a cost-effective option, but the results were sensitive to changes in survival estimates and the cost of treatment. Despite some reporting limitations, the authors’ conclusions appear to be reasonable.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
To compare the cost-effectiveness of two treatment strategies for patients with stage IB2, as defined by the International Federation of Gynecology and Obstetrics (FIGO), cervical cancer, with no signs of metastasis.

Interventions
The treatments were radical hysterectomy and pelvic lymphadenectomy with tailored adjuvant therapy (RH-TA) compared with primary chemoradiation. These two interventions were fully described with their dosages.

Location/setting
USA/secondary care.

Methods
Analytical approach:
A Markov state transition model was constructed to compare the cost-effectiveness of the two treatment strategies. The Markov states were reported and the time horizon was six years, but the costs were only incurred during the first year. The authors stated that the perspective was that of the third party payer.

Effectiveness data:
The effectiveness data were derived from a literature review. The sources searched, and the process used to identify the data, were reported. The primary clinical parameters included the percentage of patients who discontinued RH-TA treatment due to the advanced stage of pelvic cancer, the five-year survival based on patients’ risk and treatment strategy, the sensitivity of positron emission tomography and computed tomography, aborted radical hysterectomy rates, and treatment-related adverse events. Adverse events included anaemia, neutropenia, pulmonary emboli, gastrointestinal fistula, small bowel obstruction, and others.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The measure of benefit was life-years saved (LYS).

Cost data:
The cost categories included the costs of radical hysterectomy and pelvic lymphadenectomy, aborted radical
hysterectomy, radiotherapy and brachytherapy, weekly cisplatin, and adverse events. The costs for each treatment were obtained from Medicare reimbursement and fee schedules. Other costs were derived from a national database and the literature. All costs were reported in US dollars ($) and were adjusted to 2007 prices.

Analysis of uncertainty:
Extensive one-way sensitivity analysis was conducted on all the model parameters. The ranges over which the parameters were tested were explicitly reported.

Results
Overall five-year survival reached a rate of 79.6% in the RH-TA cohort and 78.9% in the chemoradiation cohort. At five years chemoradiation resulted in a mean total cost of $21,403 and RH-TA cost $27,840. An incremental analysis showed that when RH-TA was compared with chemoradiation it resulted in a cost of $63,689 per incremental LYS.

The results of the one-way sensitivity analyses and their impact on the incremental cost-effectiveness ratios were discussed in detail. The results were most sensitive to variation in the survival estimates and the cost of treatment. They were robust with regard to the cost and rates of adverse events, the proportion of patients in each specific clinical risk group, the sensitivity of positron emission tomography and computed tomography, and the proportion of stage IB2 cancer patients with metastatic disease in the retroperitoneal lymph nodes.

Authors’ conclusions
The authors concluded that RH-TA was a promising treatment option in terms of its cost-effectiveness when compared with chemoradiation for the management of patients with stage IB2 cervical cancer without metastatic disease. They also drew attention to the sensitivity of the results to variation in the survival estimates and the cost of brachytherapy treatment.

CRD commentary
Interventions:
The interventions were clearly reported with their dosages. It is not clear if other relevant comparators existed, which were not included.

Effectiveness/benefits:
The effectiveness data were derived from published studies. No systematic search of the literature was reported, but the process used to identify the data and the relevant inclusion criteria were given. This limited reporting makes it impossible to judge the validity of the data. Uncertainty in the model parameters was investigated using extensive one-way sensitivity analyses and the results were adequately reported, which enhances the generalisability of the findings.

Costs:
The costs appear to have reflected the perspective stated. Overall the level of reporting was adequate and the majority of the cost data and details, such as the price year and adjustments for inflation, were presented. The unit costs and resource quantities were not reported separately. Discounting was not relevant as the costs were assumed to be incurred over a period of one year. The uncertainty in cost estimates was investigated using one-way sensitivity analyses.

Analysis and results:
A diagram of the model structure was presented along with all the relevant details and modelling assumptions. The authors conducted an incremental analysis and the results were reported sufficiently. Sensitivity analysis was conducted on the modelling parameters, which enhances the generalisability of the findings. Although the authors said little about the limitations of their findings, they appear to have provided a balanced discussion.

Concluding remarks:
Despite some reporting limitations, the authors presented a reasonably transparent analysis and their conclusions appear to be appropriate.

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