A Canadian economic analysis of US Oncology Adjuvant Trial 9735

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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 assess the cost-effectiveness of adjuvant docetaxel and cyclophosphamide for early-stage breast cancer, compared with standard care. The authors concluded that the docetaxel combination was a cost-effective use of resources. The methods were generally good and they and the results were mainly reported in detail. The authors’ conclusions appear to be valid.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of adjuvant docetaxel and cyclophosphamide, for early-stage breast cancer, compared with standard care.

Interventions
The intervention assessed docetaxel and cyclophosphamide, compared with doxorubicin and cyclophosphamide, as an addition to treatment for operable invasive breast cancer.

Location/setting
Canada/secondary care.

Methods
Analytical approach:
A decision analytic Markov model was used to compare the docetaxel combination with the doxorubicin combination, in a hypothetical cohort of 1,000 women. The time horizon was the lifetime of the patient. The authors reported that the perspective was that of the Canadian publicly funded health care system.

Effectiveness data:
The clinical and effectiveness data were mainly from the US Oncology Adjuvant Trial 9735 (Jones, et al. 2009, see ‘Other Publications of Related Interest’ below for bibliographic details). This was a phase III prospective comparative randomised trial of 1,016 women, who were followed-up for seven years. The main effectiveness estimate was their disease-free survival, which was from this trial.

Monetary benefit and utility valuations:
The utility estimates were from several published studies.

Measure of benefit:
Life-years gained and quality-adjusted life-years (QALYs) gained were the benefit measures. Future benefits were discounted at an annual rate of 5%.

Cost data:
The direct costs were those of chemotherapy (drugs, physician visits, chemotherapy unit visits, and pharmacist time), diagnostic tests, disease monitoring during and after chemotherapy, treatment of complications from chemotherapy, and treatment for cancer recurrence. The resources were from the US Oncology Adjuvant Trial 9735, Cancer Care Ontario, and published studies. The unit costs were from Canadian cost schedules, hospital price lists, and published literature. All costs were inflated to 2008 prices, using the health care component of the consumer price index, and
reported in Canadian dollars (CAD). Future costs were discounted at an annual rate of 5%.

Analysis of uncertainty:
One-way sensitivity analyses were undertaken to explore the effects of changes in key variables and assumptions.

Results
The average life-years gained was 14.644 with the docetaxel combination and 14.022 with the doxorubicin combination. The average QALYs gained was 11.875 with the docetaxel combination and 11.359 with the doxorubicin combination. The average cost per patient was CAD 12,840 with the docetaxel combination and CAD 8,579 with the doxorubicin combination.

Compared with the doxorubicin combination, the incremental cost-utility ratio for the docetaxel combination was CAD 8,251 per QALY gained, and the incremental cost-effectiveness ratio was CAD 6,842 per life-year gained.

The sensitivity analyses, with the exception of varying the time horizon, produced similar results to those of the base case. When the time horizon was seven years, both ratios were between CAD 30,000 and CAD 50,000.

Authors' conclusions
The authors concluded that the docetaxel combination was a cost-effective use of resources.

CRD commentary
Interventions:
The interventions were reported clearly.

Effectiveness/benefits:
The effectiveness data were mainly from a large phase III clinical trial, conducted in the USA. These data are likely to have been internally valid, but as the authors pointed out, they might not have been generalisable from the USA to Canada. The authors proposed that their assumptions of no recurrence after seven years with either treatment and no life expectancy benefit with the docetaxel combination over the doxorubicin combination were conservative for the docetaxel combination. They assumed that life expectancy was the same as that of the general population after seven years. Other assumptions were tested in the sensitivity analysis. The utility weights appear to have come from two reliable sources, but the selection of these sources was not explained, and the alternative estimates for the sensitivity analyses were not reported.

Costs:
The perspective was explicitly reported and it appears that all those costs relevant to the Canadian public health care system were included. The sources for the unit costs and resource use were reported, as were the price year, time horizon and discount rate.

Analysis and results:
All the selected cost and outcome information was synthesised in a decision-analytic Markov model. The details of this model were reported, with a diagram. One-way sensitivity analyses were used to assess the impact of uncertainty. Variations in different combinations of assumptions were not assessed and a probabilistic sensitivity analysis could have more thoroughly assessed the overall model uncertainty. The authors reported the main limitations of their study.

Concluding remarks:
The methods were generally good and they and the results were mainly reported in detail. The authors’ conclusions appear to be valid.

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