Cost-effectiveness of combination versus sequential docetaxel and carboplatin for the treatment of platinum-sensitive, recurrent ovarian 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 study assessed the cost-effectiveness of sequential versus concurrent docetaxel and carboplatin for management of patients with recurrent platinum-sensitive ovarian cancer. The authors concluded that concurrent was a cost-effective strategy for this patient population as longer progression-free survival was offset by slightly lower quality of life and higher costs. The study used valid methodology that enhanced the robustness of the conclusions, but results from a phase III trial should be used to corroborate the findings.

Type of economic evaluation
Cost-utility analysis

Study objective
The study assessed the cost-effectiveness of sequential docetaxel and carboplatin versus combination docetaxel and carboplatin (sDC versus cDC) for management of patients with recurrent platinum-sensitive ovarian cancer using the findings from a clinical trial.

Interventions
Two chemotherapy regimens were examined.

cDC: Docetaxel at a dose of 30mg/m² given intravenously on days one and eight combined with carboplatin at an area under the curve (AUC) of 6mg/mL per minute intravenously on day one every three weeks;

sDC: Docetaxel at a dose of 30 mg/m² given intravenously on days one and eight every three weeks followed by carboplatin at a AUC of 6mg/mL per minute intravenously every three weeks at first progression or after six cycles of docetaxel for stable disease or a partial response.

Location/setting
USA/outpatient.

Methods
Analytical approach:
The analysis was based on a Markov simulation model with a two-year time horizon. The authors used the perspective of the third-party payer.

Effectiveness data:
Evidence on the efficacy of the two regimens was derived from a recently published prospective phase 2 randomised controlled trial by some of the co-authors of the current economic evaluation. This study provided data on efficacy of both strategies and adverse events over a follow-up of two years. The primary endpoint was progression-free survival.

Monetary benefit and utility valuations:
Quality of life was estimated using the Functional Assessment of Cancer Therapy scale. These estimates were converted into utility values using a previously validated method. The questionnaire was given at study entry, after four cycles, six cycles and at the end of the study.
Quality-adjusted life-years (QALYs) were used as the summary benefit measure.

Cost data:
The economic analysis included costs associated with chemotherapy (under examination as well as subsequent regimens), management of adverse events (drugs and health care visits) and costs of cancer recurrences. Routine laboratory work was not considered as it was similar between regimens. Costs were estimated using national Medicare reimbursement data. Some assumptions on additional costs of cancer recurrences were made. Costs were in USA dollars ($). The price year was 2010.

Analysis of uncertainty:
One-way sensitivity analyses were carried out on model inputs using published and assumed ranges of values for toxicity estimates, costs and quality of life. All model inputs were simultaneously varied in a Monte Carlo simulation in which conventional distributions were assigned to each group of parameters.

Results
Projected costs were $20,381 with sDC and $25,122 with cDC. The expected QALYs were not reported but cDC was more effective than sCD. The incremental cost per QALY gained with cDC over sDC was $25,239.

Deterministic sensitivity analysis showed that cDC remained cost-effective at a threshold of $50,000 per QALY in all scenarios except when the cost of cDC varied to 150% of the base case estimate. In this case, the incremental cost per QALY gained rose to $61,759.

In the probabilistic analysis, cDC was dominant (more effective and less expensive) in 11% of the simulations and was cost-effective (<$50,000 per QALY) in 72% of the simulations. The median incremental cost per QALY gained in the Monte Carlo simulation was $21,233 (cDC dominant to $135,105).

Authors' conclusions
The authors concluded that combined weekly cDC was a cost-effective alternative to sDC for this patient population because the longer progression-free survival offset the slightly lower quality of life and the higher costs during treatment.

CRD commentary
Interventions:
Selection of the comparators was appropriate and reflected the two chemotherapy regimens in the clinical trial.

Effectiveness/benefits:
A single study was the main source of evidence. In general, randomised trials are considered to be valid sources of clinical inputs because of the methodological rigour of their study design. In this case, little information was given on the sample size, randomisation procedure and methods used to estimate results (such as treatment completers or intent-to-treat) as the study was published already. The study was a phase II clinical trial (these do not share the same rigour as phase III studies). Thus, it was not possible to make objective assessment of the clinical inputs used in the model. Most of these inputs were subjected to sensitivity analyses to consider their impact on cost-effectiveness results. QALYs were an appropriate measure of benefit in this patient population given the impact of chemotherapy on quality of life. Utility valuations were collected alongside the clinical trial at several time points using a validated instrument (standard for cancer patients).

Costs:
The sources selected and items included suggested a third-party perspective, as stated by the authors. Total costs associated with each chemotherapy regimen and adverse events were reported. Unit costs and resource quantities were not presented separately. Typical USA sources were used for costs estimates as no such data were retrieved from the clinical trial. Triangular distributions were associated with costs that were varied in the sensitivity analyses. The price year was reported appropriately.

Analysis and results:
Costs and benefits of the two approaches were clearly presented and were synthesised appropriately using an
incremental approach and a commonly used cost-effectiveness threshold. A schematic representation of the simulation model was provided. The authors stated that they did not model the economic and health impact of adverse events if the events were the same in each chemotherapy arm. Appropriate and methodologically valid approaches were used to deal with the issue of uncertainty; the methods and results were extensively presented and discussed and showed the most influential inputs. The authors discussed some potential limitations of the analysis (such as the small size of the clinical trial). The study results were specific to the USA setting but might be transferable to jurisdictions with similar relative prices.

Concluding remarks:
The study used valid and transparent methodology that enhanced the robustness of the authors’ conclusions, but results from a phase III trial should be used to corroborate the findings.

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