Cost-utility assessment of amifostine as first-line therapy for ovarian cancer

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.

Health technology
The use of amifostine as first-line therapy for ovarian cancer.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
A hypothetical population of 55 year old females with newly diagnosed, untreated ovarian cancer, with good performance status. Patients suffered from advanced ovarian cancer and received combination therapy with cisplatin and cyclophosphamide.

Setting
Hospital setting. The study was carried out in Chicago, Illinois and Cleveland, Ohio in the United States.

Dates to which data relate
The effectiveness data were retrieved from a study previously published in 1996. The price year was not stated.

Source of effectiveness data
Effectiveness data were derived from a review from which only one study was utilised.

Modelling
A decision analysis model using a modified Markov process was set up to model the prognosis of patients followed as a large cohort over time.

Outcomes assessed in the review
The relative efficacy of amifostine in reducing chemotherapy-related neutropenic fever complications, nephrotoxicity, and neurotoxicity was estimated using the report of the phase II FDA licensing trial for amifostine.

Study designs and other criteria for inclusion in the review
Not stated.
Sources searched to identify primary studies
Although it is likely that the authors conducted a literature review to determine their eventual source of effectiveness, no details of this were given.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
The effectiveness results were retrieved from one study published in 1996.

Methods of combining primary studies
Not applicable.

Investigation of differences between primary studies
Not applicable.

Results of the review
118 patients started combination therapy consisting of 6 cycles of cisplatin and cyclophosphamide. 65 patients finished the therapy. At the end of the therapy, 79 patients suffered from mild neurotoxicity and 2 patients suffered from severe neurotoxicity. Following completion of the six cycles, 23 patients suffered from nephrotoxicity. 29 patients required antibiotics for hematological toxicity. This corresponded to 24 episodes of hospitalisation and to 179 days of hospitalisation.

Measure of benefits used in the economic analysis
The primary measure of benefit was quality-adjusted-life-years (QALYs). A group of 10 gynaecologic oncologists from Chicago provided utility estimates. A second set of utility values was derived based on assessments from 15 ovarian cancer patients who were interviewed at Northwestern University Medical Center, Chicago. Patients and physicians were asked to consider time trade-off questions.

Direct costs
Costs were not discounted. Quantities and costs were not reported separately. Direct costs included costs of amifostine per cycle, costs of hematologic toxicity, costs of treating an episode of mild nephrotoxicity and mild or severe neurotoxicity. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on actual data. Amifostine costs per cycle were based on average wholesale prices. Costs of hematologic toxicity were estimated based on a review of 25 medical records and bills of patients with cisplatin toxicity who participated in the previously mentioned study published in 1996. A group of 10 gynaecologic oncologists from Chicago provided cost estimates related to neurologic and renal toxicities. The price year was not stated.

Statistical analysis of costs
No statistical analysis was carried out.

Indirect Costs
No indirect costs were included.

**Currency**
US dollars ($).

**Sensitivity analysis**
A sensitivity analysis was carried out on the discount rate, the non-independence of toxicities, utility values, and dose of amifostine.

**Estimated benefits used in the economic analysis**
The estimated median survival was 1.799 utility-adjusted life years for the amifostine group versus 1.712 utility-adjusted life years for the control group. If the patients' assessment of utilities were used, then estimated median survival would be 2.12 utility-adjusted life years for the amifostine patients and 2.08 utility-adjusted life years for the control group.

**Cost results**
Amifostine costs per cycle were $832. Daily inpatient costs related to hematologic toxicity were estimated to be $1,733. The costs of treating an episode of mild nephrotoxicity averaged $328, while the estimated costs per episode for treating mild or severe neurotoxicity averaged $654. The expected total costs of care for the amifostine group amounted to $6,629 per patient and $3,483 per patient in the control group. The results were not significantly different using a discount rate of 5% per year.

**Synthesis of costs and benefits**
Amifostine use was associated with a $36,161 cost per QALY saved. If patients' assessment of utilities were used, a cost-utility estimate of $78,574 per QALY resulted. If the dose of amifostine were decreased from 910 to 740 mg/m2 day, amifostine use would be associated with an estimated cost of $25,474 per QALY.

**Authors' conclusions**
Amifostine use is associated with a favourable cost-utility profile that is in the range associated with widely used cancer treatment agents.

**CRD COMMENTARY - Selection of comparators**
The rationale for the choice of the comparator was clear.

**Validity of estimate of measure of benefit**
Utility adjustments are often methodologically difficult to obtain. Uncertainty exists as to what technique to use to elicit utility values and whose values to use. The authors addressed this problem by eliciting utility values from both physicians and patients. The authors acknowledged that the clinical results based on the 1996 study may differ from results observed in routine clinical practice.

**Validity of estimate of costs**
Only a narrow range of direct costs was included. The model did not include indirect costs such as lost wages for family members or friends who assist patients, or other direct medical costs, such as those related to modifications of later chemotherapy treatment. The cost results may also differ from those observed in routine medical practice.
**Other issues**
The economic model and cost and effectiveness assumptions used in this study will need to be constantly updated as practice patterns and therapy for ovarian cancer change, and experience with different agents grows.

**Implications of the study**
The results of this review need to be confirmed by a trial which reflects current practice patterns in ovarian cancer therapy.

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**Bibliographic details**

**Other publications of related interest**


**Indexing Status**
Subject indexing assigned by CRD

**MeSH**
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