Cost effectiveness of intraperitoneal compared with intravenous chemotherapy for women with optimally resected stage III ovarian cancer: a Gynecologic Oncology Group study

Havrilesky LJ, Alvarez Secord A, Darcy KM, Armstrong DK, Kulasingam S

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 chemotherapy regimens in the management of women with optimally resected stage III ovarian cancer. The intraperitoneal cisplatin regimen only became cost-effective compared with the intravenous carboplatin regimen at longer time horizons (lifetime) and when the survival benefit continued beyond that reported in the clinical data. Despite limited reporting around the clinical data and the results, the authors provided a relatively transparent analysis and their conclusions appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
This study compared the cost-effectiveness of four chemotherapy interventions for the treatment of women with optimally resected, stage III ovarian cancer.

Interventions
All four interventions had 21-day cycles and the data were from two randomised controlled trials (RCTs) by the Gynecologic Oncology Group (GOG); GOG-172 and GOG-158.

The first two interventions were the same, but used data from each of the two trials. Paclitaxel 135mg/m² was given intravenously over 24 hours on day one and cisplatin 75mg/m² was given intravenously on day two.

In the third Intervention, paclitaxel 135mg/m² was given intravenously over 24 hours on day one, followed by cisplatin 100mg/m² intraperitoneally on day two and paclitaxel 60mg/m² intraperitoneally on day eight. The data for this intervention was from GOG-172.

In the fourth Intervention, paclitaxel 175mg/m² was given intravenously over three hours, with carboplatin (area under the curve 7.5), on day one. This data was from GOG-158.

Location/setting
USA/secondary care.

Methods
Analytical approach:
A Markov state transition model with a seven-year time horizon was used. The authors reported that a societal perspective was adopted.

Effectiveness data:
The effectiveness data were obtained from published literature. The toxicity estimates were obtained from the GOG Statistical and Data Center. The main clinical outcomes were survival and chemotherapy adverse events.

Monetary benefit and utility valuations:
The methods used to derive the utilities were not reported.
Measure of benefit:
Quality-adjusted life-years (QALYs) were the measure of benefit and they were discounted at an annual rate of 3%.

Cost data:
The economic analysis included the costs of treatment and hospitalisation due to chemotherapy adverse events. All unit costs and resource quantities were reported separately, except for adverse events costs, which were reported as macro-categories. The charges for adverse events were obtained from official national sources and a cost-to-charge ratio of 0.6 was applied to reflect the true costs. All other costs were based on Medicare reimbursements. They were appropriately adjusted for inflation and were reported for the price year 2006 in US dollars ($). All costs were discounted at an annual rate of 3%.

Analysis of uncertainty:
The parameter uncertainty was investigated, using deterministic analysis, in which the following parameters were varied: the time horizon of the analysis, chemotherapy-related adverse event rates, the cost of chemotherapy regimens, the costs of adverse events and death, and the cost-to-charge ratio. Probabilistic sensitivity analysis was performed using Monte Carlo simulations with 10,000 replications.

Results
Overall median survival was estimated to be 66 months for the intraperitoneal regimen, 57 months for the carboplatin regimen, 51 months for the intravenous cisplatin regimen from GOG-172, and 48 months for the cisplatin regimen from GOG-158.

The total costs over the seven-year period were $63,114 for intraperitoneal, $18,213 for carboplatin, $59,851 for cisplatin GOG-172, and $61,093 for cisplatin GOG-158. The two intravenous cisplatin regimens (GOG-172 and GOG-158) were dominated by the carboplatin regimen as they were more costly and less effective.

When the intraperitoneal regimen was compared with the carboplatin one, it resulted in an incremental cost of $180,022 per QALY gained.

The results were sensitive to the time-horizon of the analysis, and the costs of the intraperitoneal regimen and the intravenous cisplatin regimens.

Authors' conclusions
The authors concluded that the intraperitoneal regimen only became cost-effective compared with the carboplatin regimen at longer time horizons (lifetime), and when the survival benefit was continued beyond that reported in the clinical data.

CRD commentary
Interventions:
The interventions were clearly reported including their dosages. It appears that the study was thorough in its coverage of alternative interventions in the authors' setting.

Effectiveness/benefits:
No systematic review of the literature was reported. The use of RCTs as sources for the effectiveness data was appropriate, given the strengths of their design, but no details of these primary sources, such as their study population, randomisation method, and power calculations, were provided, which makes an objective assessment of the validity of the estimates impossible. A national database is likely to represent the most valid source for epidemiological data, given the large sample of patients involved and the validated approach used to collect the primary data, but the methods used to combine data from different sources were not reported. Similarly, little information was provided on the derivation of the benefit measure. QALYs are an appropriate measure of benefit that allow for cross-disease comparisons.

Costs:
Although the authors reported that a societal perspective was adopted, the indirect costs were not included. A breakdown of the cost items and resource use was provided, and only hospitalisation costs were reported as macro-
categories. Several assumptions, made by the authors, for the cost analysis, were reported, increasing the transparency of the analysis. The price year, adjustments for inflation, and discounting were all well reported.

Analysis and results:
The model structure was presented, with a diagram, but the level of reporting for the base case and the sensitivity analysis was insufficient. For example, the expected QALYs were not reported, nor were the results of the deterministic analysis clearly presented. The authors only mentioned one limitation to their study, which was the fact that the survival data were obtained from two different phase III trials.

Concluding remarks:
Despite limited reporting around the clinical data and the results, the authors provided a relatively transparent analysis and their conclusions appear to be appropriate.

Funding
Supported by grants from the American Board of Obstetrics and Gynecology, American Association of Obstetricians and Gynecologists Foundation, National Cancer Institute, Gynecologic Oncology Group Administrative Office and GOG Tissue Bank, and Gynecologic Oncology Group Statistical Data Center.

Bibliographic details

PubMedID
18757328

DOI

Original Paper URL
http://jco.ascopubs.org/cgi/content/abstract/26/25/4144

Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Antineoplastic Combined Chemotherapy Protocols /therapeutic use; Carboplatin /administration & dosage; Cisplatin /administration & dosage; Cost-Benefit Analysis; Decision Support Techniques; Female; Humans; Infusions, Intravenous; Medical Oncology /methods; Middle Aged; Ovarian Neoplasms /drug therapy /economics /mortality /surgery; Paclitaxel /administration & dosage; Quality of Life; Treatment Outcome

AccessionNumber
22008101819

Date bibliographic record published
02/03/2009

Date abstract record published
10/02/2010