Intraperitoneal cisplatin and paclitaxel versus intravenous carboplatin and paclitaxel chemotherapy for stage III ovarian cancer: a cost-effectiveness analysis

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 two treatment options for the management of women with stage three epithelial ovarian cancer. The authors concluded that intravenous paclitaxel with intraperitoneal cisplatin and paclitaxel chemotherapy was relatively more effective, but also more costly compared with the current chemotherapy regimen. Despite some identified methodological weaknesses, the authors presented a transparent analysis and it is likely that the results reflected the available evidence.

Type of economic evaluation
Cost-utility analysis

Study objective
This study compared the cost-effectiveness of two front-line treatment options for the management of patients with stage three epithelial ovarian cancer following primary cytoreductive surgery.

Interventions
The two treatment strategies were firstly, adjuvant inpatient intravenous (IV) paclitaxel for 24 hours, with intraperitoneal (IP) cisplatin and outpatient IP paclitaxel chemotherapy (IP/IV strategy), and secondly, adjuvant outpatient IV paclitaxel for three hours and carboplatin chemotherapy (IV/IV strategy).

Location/setting
USA/secondary care.

Methods
Analytical approach:
A decision analytic model was used to compare the cost-effectiveness of the two treatment strategies. The time horizon of the analysis was five to six months. The authors stated that the perspective was societal.

Effectiveness data:
The effectiveness data were obtained from a non-systematic literature review. They appear to have come mainly from Gynecologic Oncology Group treatment protocols. The main clinical parameters included median survival time and incidence of hospitalisation due to treatment-related complications.

Monetary benefit and utility valuations:
The authors constructed a quality of well-being index. Quality of life improvements were estimated by comparison with data from a previous randomised controlled phase three trial, which used the quality of life score from the European Organization for Research and Treatment of Cancer quality of life questionnaire C30 version 2.0.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs). These were discounted at an annual rate of 3% depending on the median survival time for each treatment regimen.

Cost data:
The cost categories included hospital and professional costs of the chemotherapy regimens, hospitalisation costs for
treatment-related toxicity, wages lost due to the treatment programme, and caregiver support costs. The medical costs were based on actual charges derived from a single institution in the authors’ setting. Lost earnings were derived from data obtained from the Bureau of Labour Statistics 2006. All costs were in US dollars ($) and the price year was 2006. Adjustments for inflation were made.

Analysis of uncertainty:
One-way sensitivity analyses were conducted on all model parameters. The ranges used were reported and the results were presented using a tornado diagram. A probabilistic sensitivity analysis was conducted by means of Monte Carlo simulations. The distributions assigned to the model parameters were reported and the results were presented using incremental cost-effectiveness scatterplots.

Results
The authors reported both undiscounted and discounted results. The following results were discounted.

IV/IV had an overall cost per patient of $18,823 compared with a cost of $39,861 for IP/IV.

IV/IV had an overall effectiveness of 4.06 QALYs compared with 4.41 QALYs for IP/IV.

The incremental cost-effectiveness for IP/IV over IV/IV was $60,976 per QALY gained.

The one-way sensitivity analysis demonstrated that these results were reasonably sensitive to variations in the cost of the chemotherapy regimens and the median survival times.

The probabilistic sensitivity analysis produced an incremental cost-effectiveness ratio for IP/IV over IV/IV of $42,066 per QALY (95% confidence range: $23,013, $75,252).

Authors’ conclusions
The authors concluded that IP/IV resulted in a small prolongation of quality-adjusted survival, but was also more costly than the IV/IV treatment. They stated that future efforts should be concentrated on reducing the costs of the IP/IV treatment, but on balance IP/IV could be considered good value health care.

CRD commentary
Interventions:
The interventions were clearly reported. The comparator treatment IV/IV appears to have represented current practice in the authors’ setting.

Effectiveness/benefits:
The effectiveness data were derived from published treatment protocols and studies. However, no systematic search of the literature was reported which makes it impossible to judge the validity of the data. Due to a lack of published utility data for the population, it was necessary to make a number of clinical assumptions to estimate the utilities. The validity of these assumptions is difficult to assess, however they were fully and transparently reported.

Costs:
The costs appear to have reflected the perspective and they were reported in adequate detail. However, given the societal perspective, the use of charges may not have reflected the true costs. A cost-to-charge ratio might have addressed this issue. Adjustments for inflation and the price year were reported.

Analysis and results:
The model structure, relevant details and the modelling assumptions were clearly presented. The authors conducted an incremental analysis and the results were adequately presented. Extensive one-way and probabilistic sensitivity analyses were conducted on the modelling parameters, which helps deal with uncertainty and enhances the generalisability of the findings. All relevant details of the sensitivity analyses and the results were presented. The authors identified and clearly outlined the limitations of their study.
Concluding remarks:
Despite some identified methodological limitations, the authors presented a transparent analysis and it is likely that their results reflected the available evidence.

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